

Fishery Data Series No. 13-30

Upper Cook Inlet Salmon Escapement Studies, 2012

by

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and

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Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



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Weights and measures (metric)		General		Mathematics, statistics	
centimeter	cm	Alaska Administrative	AAC	<i>all standard mathematical signs, symbols and abbreviations</i>	
deciliter	dL	Code		alternate hypothesis	H _A
gram	g	all commonly accepted	e.g., Mr., Mrs., AM, PM, etc.	base of natural logarithm	e
hectare	ha	abbreviations		catch per unit effort	CPUE
kilogram	kg			coefficient of variation	CV
kilometer	km	all commonly accepted	e.g., Dr., Ph.D., R.N., etc.	common test statistics	(F, t, χ^2 , etc.)
liter	L	professional titles		confidence interval	CI
meter	m		@	correlation coefficient	R
milliliter	mL	at		(multiple)	
millimeter	mm	compass directions:		correlation coefficient	
		east	E	(simple)	r
		north	N	covariance	cov
		south	S	degree (angular)	°
		west	W	degrees of freedom	df
		copyright	©	expected value	E
		corporate suffixes:		greater than	>
		Company	Co.	greater than or equal to	≥
		Corporation	Corp.	harvest per unit effort	HPUE
		Incorporated	Inc.	less than	<
		Limited	Ltd.	less than or equal to	≤
		District of Columbia	D.C.	logarithm (natural)	ln
		et alii (and others)	et al.	logarithm (base 10)	log
		et cetera (and so forth)	etc.	logarithm (specify base)	log ₂ , etc.
		exempli gratia		minute (angular)	'
		(for example)	e.g.	not significant	NS
		Federal Information		null hypothesis	H ₀
		Code	FIC	percent	%
		id est (that is)	i.e.	probability	P
		latitude or longitude	lat. or long.	probability of a type I error	
		monetary symbols		(rejection of the null hypothesis when true)	α
		(U.S.)	\$, ¢	probability of a type II error	
		months (tables and		(acceptance of the null hypothesis when false)	β
		figures): first three		second (angular)	"
		letters	Jan,...,Dec	standard deviation	SD
				standard error	SE
		registered trademark	®	variance	
	AC	trademark	™	population	Var
	A	United States		sample	var
	cal	(adjective)	U.S.		
	DC	United States of	USA		
	Hz	America (noun)	United States		
	hp	U.S.C.	Code		
	pH	U.S. state	use two-letter		
			abbreviations		
			(e.g., AK, WA)		
volts	V				
watts	W				

FISHERY DATA SERIES NO. 13-30

UPPER COOK INLET SALMON ESCAPEMENT STUDIES, 2012

by

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ABSTRACT

In 2012, the Alaska Department of Fish and Game used dual frequency identification sonar to estimate an escapement of 1,581,555 sockeye salmon (*Oncorhynchus nerka*) into the Kenai River, 374,523 into the Kasilof River, and 30,000–90,000 into the Yentna River. Bendix Corporation side-looking sonar equipment enumerated 58,838 sockeye salmon escapement into the Crescent River. An escapement range for the Yentna River was estimated postseason for sockeye, pink (*O. gorbuscha*), chum (*O. keta*), and coho (*O. kisutch*) salmon from 6 sets of fish wheel selectivity indices obtained from the literature. The predominant age classes for sockeye salmon in the Kenai River were 1.2 (12.4%), 1.3 (45.1%), 2.2 (15.5%), and 2.3 (24.6%); Kasilof River 1.2 (34.0%), 1.3 (10.6%), and 2.2 (37.6%); Yentna River 1.2 (19.4%), 1.3 (43.7%), 2.2 (10.7%), and 2.3 (12.7%); and Crescent River 1.3 (52.1%), 2.2 (10.8%), and 2.3 (25.9%). Length and sex ratio information was also collected for sockeye salmon at each river.

Key words: sockeye salmon, *Oncorhynchus nerka*, Upper Cook Inlet, Kenai River, Kasilof River, Crescent River, Yentna River, Susitna River, age, sex, length (ASL), sonar, escapement, salmon migration, fish passage, fish wheel, substrate-less, Bendix, DIDSON, side-looking sonar, fish wheel coefficient, gill net, apportionment, test fish

INTRODUCTION

In Upper Cook Inlet (UCI) Alaska, sonar technology has been used to estimate hourly and daily salmon (*Oncorhynchus* spp.) run sizes in the Kenai and Kasilof rivers since the late 1970s and in the Yentna and Crescent rivers since the mid-1980s (Figure 1). The species composition of each escapement has been estimated from daily fish wheel catches in each river. In this report, “escapement” refers to estimates of the number of salmon migrating upstream to spawn past a fixed point on the river. When any number of fish are harvested upstream of the enumeration point, the number of fish that survive to spawn will be less than the escapement referred to in this report.

Optimal escapement goals (OEG), which considers both biological and allocative issues, were revised by the Alaska Board of Fisheries for late-run sockeye salmon (*Oncorhynchus nerka*) in the Kenai and Kasilof rivers 2011. In 2012, the OEG for sockeye salmon into the Kenai River was 700,000–1,400,000. More specifically, the Alaska Department of Fish and Game (ADF&G) manages for a Kenai River inriver escapement goal dependent upon forecasts and daily inseason evaluations of run strength. If the sockeye salmon run forecast is < 2,300,000, the inriver escapement goal is 900,000–1,100,000; for a run of 2,300,000–4,600,000, the goal is 1,000,000–1,200,000; and for a run > 4,600,000, the goal is 1,100,000–1,350,000 fish. The OEG for sockeye salmon into the Kasilof River is 160,000–390,000. In 2009, the sustainable escapement goal (SEG) for Yentna River sockeye salmon was eliminated because of uncertainties in the Yentna sonar\fish wheel escapement estimates so use of escapement data for inseason management was curtailed. Instead, for Susitna River sockeye salmon were established for weirs at Judd (25,000–55,000), Chelatna (20,000–65,000), and Larson (15,000–50,000) lakes (Fair et al. 2009). The biological escapement goal (BEG), which provides for the greatest potential for maximum sustained yield, was 30,000–70,000 sockeye salmon for the Crescent River in 2012.

SONAR DEVELOPMENT IN UCI

Prior to 1968, sockeye salmon escapement estimates in UCI were based on surveys of clear water spawning areas and provided no information about the distribution or number of sockeye salmon in glacially occluded waters (King et al. 1989). Commercial and recreational fishery management efforts were further hampered by lack of daily and cumulative estimates of escapement. The development of side-looking (once referred to as side-scan) sonar techniques

by Bendix Corporation¹ made it possible to estimate sockeye salmon in certain glacial tributaries of UCI.

The use of sonar to estimate the inriver salmon migration began on the Kenai and Kasilof rivers in 1968 with the use of multiple transducer systems (MTS), transducers arrayed linearly in up-looking positions (Namvedt et al. 1977; Davis 1971). Side-looking sonar aimed horizontally atop an artificial substrate was tested on the Kenai River north bank between 12 July and 3 August 1977 using a 1977 model transducer (escapement counts in 1977 were derived from an MTS array). Side-looking sonar proved to be more practical and was implemented on both banks of the Kenai River in 1978. A similar unit was deployed for the first time on the north bank of the Kasilof River in 1977 (south bank counts also used an MTS array), and by 1979 both banks of the Kasilof River were utilizing side-looking sonar. In the Susitna River, an attempt to utilize MTS equipment failed in 1976, leading to use of side-looking sonar, which began with limited success in 1978. Side-looking sonar has been used since 1979 in the Crescent River and continues to be used to enumerate the Crescent River sockeye salmon escapement.

Initially, all side-looking transducer systems were mounted on 15 cm (6 in) by 18.3 m (60 ft) diameter aluminum tubing (artificial substrate) and positioned on the bottom of the river, perpendicular to the bank. This arrangement forced fish to move across the artificial substrate and through the sonar beam. A transition to substrate-less counters began in the late 1980s to eliminate the effects that artificial substrates had on fish behavior and the constant maintenance and safety problems with tree and brush entanglements. Substrate-less counters began operation in the Kenai River in 1987 (north bank) and 1993 (south bank); Crescent River (both banks) in 1988; Yentna River in 1994 (south bank) and 1995 (north bank); and in the Kasilof River in 2003 (both banks).

Prior to the early 1980s, sonar operations were conducted at different sites on the Kasilof, Yentna, and Crescent rivers. In 1983, the Kasilof River site was relocated from the outlet area of Tustumena Lake (about 3 km below the lake) to river kilometer 12.1 (mile 7.5), near the Sterling highway bridge and closer to Cook Inlet (King and Tarbox 1984). The Susitna River site, near the confluence with Yentna, was abandoned in 1985 when recurrent flooding rendered the site untenable. The site was relocated to the Yentna River in 1986, about 9.2 km (6 mi) upstream of the confluence with the Susitna River and about 53 (river) km from Cook Inlet. Sonar operations began at Crescent River in 1979 below the outlet of Crescent Lake but relocated nearer Cook Inlet (~ 2.5 km) in 1984 (King and Tarbox 1987). The Kenai River sonar site has been located at river kilometer 30.9 (mile 19.2) since the 1960s.

A dual frequency identification sonar (DIDSON; Belcher et al. 2001, 2002) was used for the first time to estimate escapement on the south bank of the Kenai River in 2007 and on the north bank in 2008; for the first time on both banks of the Kasilof River in 2010, and for the first time in the Yentna River (both banks) in 2009. Bendix Corporation side-looking sonar counters (1978 and 1980 models) as described by King and Tarbox (1989), Gaudet (1983), and Bendix Corporation (1980 and 1984) continue to enumerate the escapement of Crescent River sockeye salmon. No plans have been made to switch to DIDSON technology in the Crescent River in the near future.

¹ Product names used in this report are included for scientific completeness, but do not constitute a product endorsement.

FISH WHEELS AND APPORTIONMENT

Fish wheels are used at all sonar sites to capture representative samples of respective runs for the purpose of apportioning sonar counts by species (when necessary) and to collect morphological information such as age, sex, and length (ASL) data from sockeye salmon. Fish wheels were once deployed along both banks of the Kenai and Kasilof rivers but beginning in the mid-1980s were reduced to one fish wheel on the north bank of each river because species composition was similar between banks. The Yentna River has always required two fish wheels, one on each bank, because of differences in species composition. Factors influencing the accuracy of escapement estimates for pink (*O. gorbuscha*), coho (*O. kisutch*), chum (*O. keta*), and Chinook (*O. tshawytscha*) salmon in the Yentna River were discussed by Tarbox et al. (1981, 1983). Prior to 1993, drift gill nets and a fish trap captured Crescent River fish for species apportionment and ASL sampling. Beginning in 1993, the use of a single fish wheel on the south bank made maintenance of sample gear less problematic, improved operational integrity and provided larger sample sizes for apportionment and stock analysis.

Prior to 1999, a minimum fish wheel catch of 150 fish was required to apportion sonar counts in the Kenai River. However, during periods of low passage rates, it would take several days to attain an adequate sample size. In 1999 the apportionment rules changed so that apportionment would not begin until salmon species other than sockeye exceeded 5% of the total fish wheel catch and the catch of other salmon was in an upward trend. The same criteria were also applied to the Kasilof River. Altering the method by which sonar counts were apportioned to species did not significantly change the final sockeye salmon estimates ($p<0.05$; S. Carlson, retired ADF&G Biometrician, Soldotna, personal communication) and was more defensible. Salmon species have always been apportioned from Yentna River sonar counts by bank because of the variability of run timing and differences in species composition between banks. The same has been true on the Crescent River since 1993, where apportioned sonar counts have been based on the catch of a single fish wheel located on the south bank.

OBJECTIVES

The 4 main objectives for UCI salmon escapement projects in 2012 were to estimate: (1) the daily and cumulative escapement and run timing of sockeye salmon into the Kenai, Kasilof and Crescent rivers; (2) a minimum and maximum escapement range for the Yentna River; (3) age, length, and sex compositions for sockeye salmon escapements in each river; and (4) differences between individual observers who counted DIDSON subsample image files during the season. Other lesser objectives included: 1) a feasibility study conducted on the Yentna River to test drift gill netting as a potential sampling method to replace the use of fish wheels and 2) stream surveys on Quartz and Ptarmigan Creeks in the upper Kenai River watershed. Results of escapements projects conducted by other agencies and organizations are also briefly mentioned in this report.

METHODS

SONAR SITES

The Kenai River is a glacial river about 120 m wide (at the sonar site) when the water level peaks in early August. The river (bottom) profile (Figure 2) has remained relatively the same since the 1960s when sonar was first tested in the river. The Kenai River north bank transducer

was located on the inside of a gentle curve in the river that slopes gradually (~1 m drop in 30 m) toward the opposite bank causing fish to be more dispersed during low water. The south bank slope is steeper (dropping ~1.5 m within the first 10 m, 2.2 m/25 m) and deeper with swifter current than the north bank, forcing most fish to stay within 2–10 m of shore throughout the run. The river bottom consists mostly of rocks 10–30 cm in diameter along both banks with a few bigger rocks (~50 cm) scattered along the south bank.

The Kasilof River is a glacial river about 60 m wide at the sonar site when it peaks in early August. The north bank transducer site sloped downward 0.6 m within the first 3 m from shore then flattened to a slope of ~0.25 m in 30 m. The south bank slope is relatively constant, dropping slightly more than 1 m in 40 m. The river bottom consists mostly of rocks 20–60 mm in diameter along both banks, although larger rocks and boulders exceeding 1 m³ were common along the north bank.

The Yentna River is very turbid, 3–5 cm (secchi disc depth) at the surface, ~250–300 m wide at the sonar site and rising and falling up to 0.2 m daily. The river profile at each transducer site was relatively steep, dropping 4 m (depth) within 20 m distance on the north bank and over 3 m in the first 10 m on the south before flattening in the next 10 m of range. The substrate consists of rounded rocks on the north bank and angular or blocky rocks on the south, averaging 10–30 cm in diameter along both banks.

The width of the Crescent River at the sonar site has generally been 40 m throughout the operational period but can increase to 70 m with an increase in flow. Crescent River bottom profiles have not been calculated. The north bank transducer was located on the inside of a gentle bend in the river where the substrate sloped away along a (intermittently) submerged gravel bar for a considerable distance allowing for a counting range of 10–11 m or more. The south bank transducer was on the outside of the bend and across from the north bank transducer. This bank slopes at a sharp angle limiting total range to 4–5 m. The river bottom consists mostly of rocks 20–60 mm in diameter along both banks, although larger rocks and boulders exceeding 60 mm can be found along the south bank.

DIDSON OPERATIONS

The DIDSON operated on one of 2 frequencies, one of 1.8 MHz with an acoustic beam consisting of 96, 0.3° x 14° beams and a range limit of 10 m, and the other of 1.1 MHz with an acoustic beam consisting of 48, 0.4° x 14° beams and a range limit of 30 m. The pulse length of the DIDSON makes it difficult to field test target strengths (TS), however, a 38.1 mm calibration sphere was clearly seen in DIDSON images from early field tests (Maxwell and Gove 2007). The TS of the sphere is theoretically between -38 dB and -39 dB for each frequency at a water temperature of 9°C.

All DIDSON transducers were mounted on an aluminum H-shaped stand in about 0.6 m of water and ~15 cm above the bottom in a horizontal side-looking position on each bank. The attitude sensor was mounted externally to the DIDSON transducer, which was mounted to a rotator operated by a control box located in a shed. The DIDSON transducer was placed 1–1.5 m from the offshore end and immediately upstream of a short weir, which extended approximately 3–6 m into the river.

An automated rotator coupled with an attitude sensor assured proper aim once the transducer was deployed. The aiming protocol of Maxwell and Smith (2007) was used as a guideline to

determine the best aim for each river. The DIDSON position, the nominal beam angle, and the range were used to calculate and graph the sonar beam over each river profile. The height of the transducer was adjusted above the river bottom to determine “best fit” or beam angle for the desired range of the beam. At the start, the angle of the rotator/transducer was set and adjusted by an attitude sensor and seldom adjusted unless the transducer moved. The same beam angles were used in 2012 as in previous years because the DIDSON transducer was placed in the same location, at the same height and aimed the same direction horizontally. To verify the aim, an artificial target or float was moved along the river bottom ~2 m in front of the transducer and through the acoustic beam. Once a proper aim was established, pitch and roll data from the attitude sensor was collected to maintain that aim, particularly when the DIDSON had to be moved or cleaned. Silt buildup behind the DIDSON lens was a problem, so lenses were cleaned once a week on the Kenai and Kaslof rivers and once a day on the Yentna River to maintain signal strength integrity and visual acuity.

Auto-counting methods have been tested for DIDSON but have not been very accurate (Suzanne Maxwell, Commercial Fisheries Biologist, ADF&G, personal communication). Instead of auto-counting, DIDSON’s video like images were manually counted on a computer screen. Once each hour, DIDSON recorded two 10 min image files of fish passage within ranges of 1–10 m and 10–20 or 10–30 m from shore depending on fish distribution. Laptop computers collected data and backed it up on 750 GB or 1 TB external hard drives. Technicians played back an image file that contained a recording, counting all fish observed within each file then expanding to an hourly estimate for fish passage at the given range. The nearshore files, set at high frequency, usually recorded at 8 frames per second while the offshore files (low frequency) recorded at 6 frames per second.

To process and count the raw images as quickly and accurately as possible, a DIDSON background subtraction algorithm was often used to view the images of fish against a black background. For counting purposes, an intensity setting of 40 dB and threshold of 4–5 dB produced the best contrast that ensured counting ease and accuracy. Playback frame rates often varied from 8–30 frames/s depending on fish densities and the ability to accurately differentiate fish images by individual observers. Intensity and threshold levels used by technicians were relatively constant with small variations between individuals for personal preference.

Estimating Escapement

All moving targets (fish) were counted on the computer screen for each near shore ($n_{(n)}$) and offshore ($n_{(o)}$) 10 minute file, differentiating upstream (n_u) from downstream (n_d) swimming fish. The number of salmon migrating upstream in an hour (N_h) was estimated by

$$N_h = 60 \frac{(n_{u(n)} - n_{d(n)}) + (n_{u(o)} - n_{d(o)})}{10} \quad (1)$$

All 24 hour estimates of a calendar day were summed to produce the daily escapement (N_d):

$$N_d = \sum_{h=1}^{24} N_h \quad (2)$$

Observer Variability

Counting variability between observers from the Kenai, Kasilof, and Yentna rivers was examined again in 2012. Previous studies indicated that differences between observers increased for rivers with higher densities (Westerman and Willette 2011), especially for the Kenai River. Each observer recounted a total of 30, 10 min DIDSON subsample files recorded during or near the peaks of the 2011 Kenai, Kasilof or Yentna river runs. The Kenai and Kasilof crews counted 2011 files so observers could familiarize themselves with counting in preparation for 2012. All counts were done from nearshore (1–10 m) subsample recordings (both banks) where fish abundance and the likelihood of error were greater than less abundant offshore subsamples. The number of fish per subsample in all Kenai River files ranged between 100 and 1,600 fish; Kasilof and Yentna rivers ranged between 50 and 200 fish. Observer counts were stratified for every 100 fish based on averages (Equation 3a) of each sample (100–199, 200–299, etc.), then averages determined from these strata were compared against those of each observer.

For each river, the number of fish counted by each observer per subsample was compared against the crew average for that subsample:

$$\bar{f}_i = \frac{\sum f_i}{n_i}, \quad (3a)$$

where:

\bar{f}_i = average number of fish for a given subsample (i),

$\sum f_i$ = sum of fish counts of all observers for a given subsample, and

n_i = number of observers for a given subsample.

The number of observers in each crew (x), were 3 for Kasilof and 4 each for Kenai and Yentna. The observer average of all subsample counts (30) was also compared to the crew average of all subsamples ($30x$):

$$\bar{F}_o = \frac{\sum f_o}{30x}, \quad (3b)$$

where:

\bar{F}_o = average of all observers, and

$\sum f_o$ = sum of all subsample counts for all observers.

The standard deviation (SD) provided a measure of error between observers, and correlation (R^2) values indicated the relationship between an individual's subsample count and the average of the crew for that same subsample. These values were compared against the averages for each sample and for all samples ($n = 30$).

BENDIX OPERATIONS

In 2012, the Crescent River sockeye salmon migration was estimated using Bendix Corporation, single beam, side-looking sonar counters (1978 and 1980 models). The Bendix counters have a

fixed pulse width of 100 μ s, use a 515 kHz transducer either multiplexed in an alternating mode between 4° for offshore detection and 2° for nearshore detection, or on a single beam. The counting threshold was preset by the manufacturer at approximately -38 dB but a standard target (-41 dB) typically saturated the counters at normal voltage output levels (Westerman and Willette 2010) when tested in a swimming pool. Theoretical TS's for Bendix of a 38.1 dB calibration sphere is -43.2 dB (Maxwell and Gove 2007).

Bendix transducers were aimed manually on both banks. The aim was checked by moving an artificial target (a sealed, weighted plastic sphere with a TS approximating that of an adult salmon) along the river bottom and through the ensonified area at various (reachable) distances from the transducer. Aim was verified when the target was detected by the Bendix counter with simultaneous visual recognition on an oscilloscope. Transducer placement in the river has been relatively consistent from year to year where >80% of the fish passage occurs within the nearshore half of the ensonified area (counting range). Short weirs (<6 m wide) were placed immediately downstream of the transducer, ensuring that fish pass through the sonar beam and not too near or behind the transducer.

The Bendix transducers convert electronic signals into an acoustic pulse transmitted from the transducer, through the water along the river bottom. Any object, or target, that passes through this acoustic pulse or "beam" will return an echo to the counter for electronic interpretation. Before a target can be counted as a single "fish" by the Bendix counter, the echoes must meet or exceed a set threshold, fixed "hits to count" criteria and ping rate (pulse repetition rate) that matches the swimming speed of fish. Targets were counted by observing returning echoes displayed on an oscilloscope, then compared to the Bendix count. The ping rate was usually adjusted (calibrated) if relative error between the counter and oscilloscope was >10% although a 20% difference was considered adequate. Calibrations lasted 10 minutes or until at least 100 fish were observed on the oscilloscope, whichever came first. If the automated count was less than observed on the oscilloscope, the ping rate was increased, or slowed if the counts were too high. Under-counting or over-counting depended upon the time a fish spent in the acoustic beam of the transducer. Counters were calibrated between 0700 and 0100, at least 2 hours/day, and with greater frequency during episodic periods of high fish passage.

The power output or receiver sensitivity, critical in target detection, was set early in the run, at a typical historical level and was not adjusted for calibration purposes. If the counting range was extended or shortened substantially, sensitivity was adjusted up or down to improve target detection if necessary. The sensitivity for each counter was set to maximize detection of migrating fish but limit background noise that can hinder target detection. The spatial distribution of fish from the transducer, based upon sector counts, determined the best counting range.

Estimating Escapement

The Bendix counting range, divided into 12 sectors, recorded fish counts (N_s) wherever the fish crossed the acoustic beam (distance from shore). These sector counts were printed at the start of every hour (sector-hour counts) and summed to get a count for each hour (N_h):

$$N_h = \sum N_s. \quad (4)$$

A valid count meant that auto-counted fish were relatively close to 1:1 (within 10%) with all fish passing through the sonar beam. Valid sector counts were summed for the hour and added to other hourly counts to derive an escapement count for the day (N_d):

$$N_d = \sum N_h. \quad (5)$$

False Counts (Debris)

An invalid count, also called a false or debris count, created a substantially higher or lower than an acceptable ratio of visually observed fish (oscilloscope) to auto counted fish. These false counts were usually caused by bottom noise (rocks), holding salmon, river debris or equipment failure and misrepresented actual sector/hour fish passage. False counts were replaced by an interpolated count for any given sector (\bar{x}_y), an average from all valid counts within the affected and adjoining sectors:

$$\bar{x}_y = \frac{\sum s_{(xyz)}}{n_{(xyz)}} \quad (6)$$

where:

$\sum s_{(xyz)}$ = sum of all valid counts within affected (y) and adjoining sectors (xz), and

$n_{(xyz)}$ = number of valid counts within sectors (x, y & z).

When false counts were annotated as debris, MS Excel formatting automatically inserted the interpolated number (equation 6) into the affected sector(s) or hour(s).

$$N_h = \sum s + \sum \bar{x} \quad (7)$$

This method is also applied to missing hours of DIDSON counts although sectors are not applicable to DIDSON operations.

If a sonar unit did not operate for more than a day because of electronic problems or high water, a ratio of counts between banks was applied to adjust for the missing (daily) escapement estimates for B_1 (hourly estimates were not calculated, only daily estimates):

$$N_d = \left(\frac{\sum_{3d} B_1}{\sum_{3d} B_2} \right) b_2, \quad (8)$$

where:

$\sum_{3d} B_1$ = sum of 3 prior days of valid escapement estimates for bank 1 (B_1),

$\sum_{3d} B_2$ = sum of 3 prior days of valid escapement estimates for bank 2 (B_2), and

b_2 = valid daily escapement estimate of bank 2 for the day(s) bank 1 did not operate.

FISH WHEELS

Fish wheels operated on the north banks of the Kenai and Kasilof rivers, both banks of the Yentna River and on the south bank of the Crescent River to catch fish for apportionment purposes and to collect ASL information from sockeye salmon. All fish wheels were of similar design consisting of framework that supports aluminum or foam-filled plastic floats, an axle and livebox. Partitioned, custom made aluminum floats, prevented the fish wheel from sinking should a float develop a leak. Two baskets and 2 paddles were mounted to the axle at 90° angles to each other that rotated in the river. As the axle rotates in the current, the baskets scoop fish from the river, dropping them in a livebox mounted to the outside of the fish wheel frame. The baskets were fitted with 2–2.5 in (5–6 cm) tarred netting and a slide, which funneled the fish toward an opening in the basket netting and into the livebox. The livebox was mostly submerged in the river, where a constant flow of freshwater kept fish alive and vigorous. All fish wheels were anchored to shore using a boom (either a wooden or steel 4 x 4) to station the wheel in current deep and fast enough to allow the axle to turn. The baskets rotated as close to the bottom as possible where most fish migrate. Cables or rope secured the front end to shore and kept the fish wheel parallel to the current. Depending on current, spinning speed of the fish wheel ranged between 2 and 5 revolutions per minute (rpm) with optimum speed at 3–4 rpm (any slower or faster reduced its effectiveness). A short weir, 3–6 m wide (depending on river) with pickets spaced no more than 7 or 8 cm apart, extended from shore diverting nearshore fish toward the spinning baskets. These weirs were either aligned with or just downstream of the axle or immediately below the fish wheel (nearshore) float. At some sites it was practical to extend the weir immediately below the wheel, past the inshore float, to prevent fish from passing under the fish wheel float and avoiding the catch zone.

In 2012, the Kasilof River fish wheel was positioned under the Sterling Highway Bridge for the first 3 weeks of operations, then relocated 30–40 m upriver when the water level was higher. The wheel fished more effectively from start to finish when fished in these locations.

Yentna River fish wheels were also used to recapture tagged salmon as part of a fish wheel species selectivity study and Susitna River chum and coho salmon abundance study. Tissue samples were also collected from sockeye salmon and for genetic analysis. This was the fourth and final year of the wheel selectivity study. To meet the objectives of these studies, each Yentna fish wheel operated for 16–18 h/d during 3 time periods; 0600–1200, 1200–1800, and 1800–2359 hours (prior to this study, fish wheels operated about 6 h/d).

Apportionment

Kenai or Kasilof river sonar counts are not apportioned until the species composition of the fish wheel catch is at least 5% pink and/or coho salmon and the evidence of a trend is obvious. This guideline was developed to accommodate situations where run timing of sockeye and pink salmon (and sometimes coho salmon) overlap, usually during even-numbered years. All daily sonar estimates were apportioned for the Yentna and Crescent rivers because of big runs of pink, chum, and coho salmon into those systems.

At Kenai, Kasilof, and Crescent rivers, the daily escapement of each salmon species, and Dolly Varden at Crescent River, N_x , was determined by multiplying the sonar escapement estimate or count (N_d) by the percentage of each species captured in the fish wheels, i.e.,

$$N_x = N_d \left(\frac{F_x}{F_t} \right), \quad (9)$$

where:

F_x = the daily catch of species x , and

F_t = the total daily salmon catch in the fish wheel.

When the fish wheel catch was low (<20 fish) or did not operate during a 24 h period, the catch from the 2 previous days were combined with the low catch to calculate F_x and F_t to estimate N_x .

The abundance of non-salmon in fish wheel catches, such as rainbow trout and whitefish, are typically small (<1%) so these fish are not apportioned from the total sonar count. However, relatively high abundances (~5–10%) of Dolly Varden are apportioned from the Crescent River counts because of acoustic sizes similar to those of salmon (Davis and King 1994).

Species selectivity of the Yentna River fish wheels has been a persistent concern. Beginning in 2009, fish wheel selectivity coefficients (Table 1) derived from studies on the Susitna (ADF&G 1983) and Taku rivers (Meehan 1961), and Flathorn (current year) were factored into daily (total) fish wheel catches to determine a minimum-maximum escapement range for Yentna River sockeye, pink, chum and coho salmon.

The lowest and highest of 7 estimates were used to establish the escapement range for each species ($n_{rs(i)}$). The coefficient-adjusted daily escapement was estimated by:

$$n_{rs(i)} = \left(\frac{\frac{F_{(rs)}}{c_{i(rs)}}}{\left(\frac{F_{(rs)}}{c_{i(rs)}} \right) + \left(\frac{F_{(ps)}}{c_{i(ps)}} \right) + \left(\frac{F_{(cs)}}{c_{i(cs)}} \right) + \left(\frac{F_{(ss)}}{c_{i(ss)}} \right)} \right) N_d \quad (10)$$

where:

$F_{(rs)}$ = daily fish wheel catch of sockeye salmon,

$F_{(ps)}$ = daily fish wheel catch of pink salmon,

$F_{(cs)}$ = daily fish wheel catch of chum salmon,

$F_{(ss)}$ = daily fish wheel catch of coho salmon,

$c_{i(rs)}$ = the i^{th} fish wheel selectivity coefficient for sockeye salmon,

$c_{i(ps)}$ = the i^{th} fish wheel selectivity coefficient for pink salmon,

$c_{i(cs)}$ = the i^{th} fish wheel selectivity coefficient for chum salmon, and

$c_{i(ss)}$ = the i^{th} fish wheel selectivity coefficient for coho salmon.

Age, Sex, and Length Collection

Sample sizes for estimating ASL compositions were 0.1% of the previous day's sockeye salmon escapement estimate on the Kenai River, 0.2% on the Kasilof River, and 0.5% on the Crescent

River. A single scale for age analysis was collected from a preferred area on the left side of each fish, on a line between the posterior edge of the dorsal fin and anterior portion of the anal fin about 2 or 3 scale rows above the lateral line. If the preferred area was scarred or void of scales, the scale was either taken in front of the preferred area or from the same spot on the right side of the fish. Lengths were measured from mideye to fork of tail. ASL information and genetic samples were collected from every sockeye salmon captured by the Yentna River north bank fish wheel and from every sixth sockeye salmon captured by the south bank fish wheel during each of three 2 hr (genetic) sampling periods. Total lengths (snout to fork) of pink, chum, and coho salmon ($n = 400$) were also measured from the Yentna River.

CESSATION CRITERIA

Operations ended on the Kenai, Kasilof and Crescent rivers when daily escapements met cessation criteria of $\leq 1\%$ of the total cumulative estimates of sockeye salmon for 3 consecutive days. The cessation criteria for the Kenai and Kasilof River sonar enumeration projects could not be applied until after the closure of commercial fishing within the Kenai, Kasilof, and East Forelands sections. Exceptions to this criterion have been made if budgetary constraints and/or environmental factors such as high water put equipment or personnel at risk and the run was near the historical end dates as well as close to the 1% cessation criteria.

YENTNA RIVER GILL NET

This was the first year that test fishing (drifting gill nets) was done in the Yentna River to determine feasibility of replacing fish wheels to apportion sonar counts. A few more years of comparison studies need to be conducted before any decisions can be made about the feasibility of this method. The method was similar to that used on the Nushagak River (Brazil and Buck 2010) with some modifications. For instance, a 12.1 cm net was used instead of a 20.6 cm net because of the abundance of small salmon in the Yentna River. All drift gill netting was done within 30 m of each bank and not mid river, and drift times were less than on the Nushagak because of time and budget constraints.

Three drift gill nets of different sizes, 12.1 cm (4.75 in), 13.0 cm (5.12 in), and 15.2 cm (6.0 in) were fished along each bank during each of 3 sampling periods/day. Period 1 covered the hours between 600 and 1200, period 2 between 1200 and 1800, and period 3 between 1800 and 2400. Each gill net was 10 m in length, approximately 4–5 m deep and constructed of #12 mono twist filament webbing, EF-6 floats, and 85/100 lead line.

Gill net catches needed to be as representative of fish passage within the ensonified zone of the DIDSON so drifting was restricted to those areas. Test fishing was conducted within ~30 m of shore and at least 30 m downstream of the transducers and/or fish wheels along both banks, to avoid catching fish that were aggregated below the weirs. Each drift was called a set which began as soon as the crew deployed the net and ended when the net was pulled. Test fishing along each bank occurred in each of 3 periods per day, 6 minutes/period/mesh as described above. The crew was allowed to adjust fishing time to give priority to other project needs. No fishing was conducted at night because of safety concerns.

The gill net apportionment method was similar to that used to apportion sonar counts using fish wheel catches (Westerman and Willette 2011). Averages were used to apportion sonar counts for those days gill netting was not conducted or the catch (sample size) for the day was < 20 fish.

Averages were calculated using catches 3 days before and/or 3 days after affected days, depending on availability of data.

STREAM SURVEYS AND WEIR COUNTS

Stream surveys and weir counts were important indicators of run strengths in UCI in 2012. Details about these results are available from the respective agencies responsible for the data. A foot stream survey was conducted on Quartz Creek by ADF&G, Division of Commercial Fisheries during the historical peak of sockeye salmon spawning activity (late August) to assess tributary escapements in the upper Kenai River drainage. All observed fish, living and dead sockeye salmon and other species of fish, were counted and evidence of predation noted. The Quartz Creek survey covered the lower 7.5 km of the creek starting at the Matanuska Electric Association substation on the Sterling Highway and ending at Kenai Lake. A stream survey (foot) of the lower 2.5–3.0 km of Ptarmigan Creek was also conducted by Division of Commercial Fisheries. Other indicators of run strength in the upper Kenai River drainage (weir counts on the Russian River) were provided by the Division of Sport Fish and Cook Inlet Aquaculture Association (CIAA; weir counts from Hidden Creek). CIAA also operated weirs at Judd, Chelatna, and Larson lakes within the Susitna River watershed. The Division of Sport Fish in Palmer also operated a weir on Fish Creek and stream surveys (aerial and ground) on a number of Northern District streams and lakes.

CLIMATOLOGICAL

Water and air temperatures, water depth (staff gauge), and general weather conditions were recorded at each of the sonar sites. Turbidity or water clarity (secchi disc) was measured in the Kenai, Crescent and Yentna rivers but not in the Kasilof River.

RESULTS AND DISCUSSION

Conditions were adequate for using sonar to estimate salmon escapement in each of 4 river systems in UCI because 1) most sockeye salmon migrate near shore (<10 m) within range of a transducer beam and near the bottom; 2) salmon densities were challenging but not overwhelming in the Kenai, Kasilof, Yentna and Crescent rivers; 3), Bendix calibrations and processing of DIDSON files were completed in a timely and reasonably accurate manner; and 4) the acoustic size of migrating fish and TSs were within detection thresholds of Bendix counters and DIDSON. Target strengths of (tracked) salmon averaged -32.2 dB in the Copper River (Maxwell and Gove 2007) and between -32.0 and -32.4 dB in the Yentna River (Tarbox and King 1991). These TSs were well above the minimum thresholds for DIDSON and Bendix sonar which have detected calibration spheres of -38.1 dB and -43 dB.

KENAI RIVER

The largest documented counts occurred in the Kenai River in 1987 (the Glacier Bay oil spill, 2.2 million fish) and 1989, (the Exxon Valdez oil spill, 2.3 million fish) when commercial fishing was restricted for part or all the fishing season.

The final Kenai River sockeye salmon escapement was estimated at 1,581,555 fish, the eighth highest estimate since 1979 (Tables 2 and 3) exceeding the maximum inriver goal of 1.1–1.35 million sockeye salmon, a goal based on a Kenai River run forecast of >4.6 million fish (http://www.adfg.alaska.gov/static/fishing/PDFs/commercial/2012_uci_salmon_summary.pdf).

Pink, coho and Chinook salmon apportioned from the total sonar estimate were not indicative of run strength because the project operational period did not coincide very well with the complete run timing of these species.

Most of the escapement (~80%) occurred within a 21 day period, beginning 15 July, with the midpoint of the escapement on 22 July (Table 4), 1 day earlier than the historical average since 1979 and 2 days earlier than the average for 1997–2011. The escapement peaked on 16 July when ~196,000 sockeye salmon passed the sonar site with a lesser peak on 22 July (~111,000 fish; Figure 3).

Run timing was similar for both banks with a higher percentage (58%) of fish migrating along the north bank (Table 5; Appendices A1–A2). However, fish distribution from shore differed by bank (Table 6) because of differences in depth and bottom profile (see Methods section). During the first 2 weeks of July, <50% of the fish migrated within 0–10 m of the north bank transducer compared to >75% within 0–10 m of the south bank transducer. Later in the run with rising water levels, fish migrated closer to shore along each bank, and by 11 August >80% were passing within 10 m of the transducer on the north bank and >95% on the south bank. By 16 August, a few more salmon were moving beyond 10 m along both banks which was about the time pink and coho salmon densities increased. Subsample counts for the entire season indicated ~80% of the north bank fish and ~96% of the south bank fish migrated within 10 m of each transducer.

After mid-July, many fish observed beyond 20 m on the south bank were Chinook salmon, based on their size and swimming behavior observed in DIDSON images. A few Chinook salmon were also observed beyond 20 m of the north bank but were usually intermixed with sockeye salmon. Many of the Chinook salmon appeared to be spawning pairs.

Average hourly passage trends were relatively similar between the north and south bank (Figure 4; Appendices A3–A4). Salmon passage rates met or exceeded a constant or average daily rate of 4.2% (the average % hourly passage rate for a 24 hr period) during the mid-afternoon or evening hours along the north bank and throughout much of the day beginning mid-morning along the south bank. Fish passages were lowest throughout the morning hours along both banks.

The Kenai River fish wheel caught (Table 7) 1,910 salmon with sockeye salmon (94.1%) comprising almost the entire catch with a few pink (4.3%), coho (0.5%) and Chinook salmon (1.1%) present. Total catch per unit effort for sockeye salmon (2.6 fish/hr) was less than half the historical average (Table 8) for an even year, probably due to high water clarity. Total catch per unit of effort (CPUE) for all species was almost one-third of the average for an even year. In even years, the percentage of pink and sometimes coho salmon will exceed 5% of the daily fish wheel catch late in the season (August). However, estimates for species other than sockeye salmon have limited value as indices of total passage, because (1) their run continues beyond the operational time frame of the project, and (2) fish wheel avoidance (e.g., Chinook salmon). Most Chinook salmon do not migrate near shore and are frequently observed in the outer ranges (10–30 m) of DIDSON.

The predominant age components of the sockeye salmon escapement were 1.3 (45.1%), and 2.3 fish (24.6%) based on a sample of 419 (Table 9). Age-1.2 fish (12.4%) and -2.2 fish (15.5%) were also abundant. Age-1.3 fish averaged 579 mm and 2.3 fish averaged 580 mm which was about average for each age class (Table 10). The average length for all age classes combined

was 565 mm, about 57 mm larger than the historical average but well within the historical range of 489–576 mm. The male to female ratio (0.8:1) was consistent with the average historical ratio.

Some DIDSON image files ($n = 35$) from 2011 were recounted by each Kenai River crew member to estimate count variability between observers using average counts as a comparison baseline. Most files selected for this comparison analysis (~80%) ranged between 200 and 900 fish/h (10% < 200 fish and 10% > 900 fish). The overall average for each observer (average for 35 samples combined) correlated closely with the average range for the entire crew ($R^2 = 0.975$ – 0.994 ; Table 11). Files ranged between ~50 and 1,700 fish/file averaging 598 fish ($SD = 5.8$). These same files when counted in 2011 averaged 600 fish/file. Variability between observers increased as fish densities increased ($SD = 3.1$, <299 fish; $SD = 38.3$ >900 fish) and were less consistent as sample densities exceeded 600 fish (Figure 5). Correlations among observer counts were lower when subsample counts exceeded 900 fish ($R^2 = 0.688$) compared with subsample counts <300 ($R^2 = 0.969$), 300–600 ($R^2 = 0.953$) and 600–900 ($R^2 = 0.815$). The original estimates from 2011 were lower than the 2012 averages ($R^2 = 0.914$). The trend was similar in 2011 when observer differences were more variable at higher densities.

The actual escapement is unknown so rather than use any single observer as a benchmark with which to compare other observers, average crew counts were used as the benchmark for each of the subsamples. The biggest challenge for any observer to counting fish from Kenai River image files, more so than any other escapement project in UCI, was an ability to detect individual fish within high densities of fish. High densities created acoustic shadowing effects that often masked fish passing side by side and made it difficult to keep track of counted and uncounted images. The closer to the transducer high densities of fish passed, the more profound the problem. Observers were able to counter this problem by adjusting the frame rate and intensity to detectable levels. This was a big concern on the south bank, where many fish were tightly packed within 2–5 m throughout the peak of the run, creating these shadowing effects. On the north bank, fish were more evenly distributed throughout the detection range of the DIDSON posing a different problem; that is, “mentally” tracking fish and remembering which fish were counted as they crossed the computer screen. Masking and distribution problems were not always exclusive to one bank or the other; many times these problems were prevalent on both sides of the river. Another problem was lower image quality on the north bank due to the long range requirement and capabilities of the particular DIDSON unit.

Late run Russian River and Hidden Creek weir counts and stream surveys on Quartz and Ptarmigan creeks provided an upper Kenai River index of 125,430 sockeye salmon, about 7.8% of the estimated sockeye salmon migration past RKM 31 sonar site (Table 12). Stream survey counts were conservative, because 1) unknown quantities of fish were observed in Kenai Lake at the mouth of both Quartz and Ptarmigan creeks at the time of the surveys, 2) any fish in water >1.5 m deep were difficult or impossible to see, 3) early (or late) spawners were not counted because only one survey was conducted (a few sockeye salmon were observed spawning in Quartz Creek as late as mid-October), and 4) very few dead fish were observed in either creek, probably an indication that the surveys were conducted a little early. A later survey of either creek was not conducted because of weather and budget constraints. The total late run Russian River weir and stream survey count was 54,911 and 25,471 sockeye salmon and the Hidden Lake weir count was 29,789. The late run Russian River escapement of sockeye salmon fell within the SEG for this stock (30,000–110,000) but was slightly less than the 44 year average dating back

to 1969. Correlations between combined survey/weir counts and sonar estimates ($R^2 < 0.25$) have never been strong (Westerman and Willette 2010).

The Kenai River, a glacially fed river, rose only 0.3 m throughout the summer and was highest on 1 July and lowest on 16 August (Table 13; Figure 6). This is the opposite of the normal pattern, i.e., lowest in early July and peaking in August. This may partly explain why water was so clear in 2012 (turbidity = 108.7 cm), a result of cool temperatures that inhibited glacial melt keeping water levels down. Water clarity in 2012 was second only to 2005. Air temperature was about 4°C cooler than the average for the period 1987–2011. Fish distribution from shore was affected by water level; the shallower water dispersed fish throughout the sonar range and farther from shore. This wide dispersion of fish made it challenging for observers to track fish on the computer screen.

KASILOF RIVER

The Kasilof River sockeye salmon escapement estimate for 2012 was 374,523 sockeye salmon (Table 14) falling within the upper and lower limits of the OEG (160,000–390,000). The 2012 escapement into the Kasilof River, the fourth highest documented escapement since 1983, was affected by a highly restricted commercial set net fishery that was essentially closed for the summer due to a poor return of Kenai River Chinook salmon. Eight of the highest documented escapements into the Kasilof River have now occurred in the last 10 years with the highest estimated escapement occurring in 2004 when about 578,000 sockeye salmon passed the Kasilof River sonar counters. Kasilof River sonar counts were not apportioned because of a low percentage (<3%) of other species in daily fish wheel catches.

Fish were slow to arrive in 2012. The midpoint of the escapement occurred on 20 July (Table 15), 5 days later than the historical average (1979–2011) with the majority of the escapement (80%) passing the counting site in 33 days, also 5 days less than the historical average (1979–2011). Three substantial peaks exceeding 26,000 fish occurred on 16 July, 21 July and 25 July (Figure 3). Approximately 66% of the fish were estimated to have migrated along the north bank which was substantially higher than the historical average of 57% for all years since 1979; (Table 5; Appendices B1 and B2). For unknown reasons, an increasing percentage of fish passage along the north bank has been a trend since 2005. Prior to 2005, fish were either south bank oriented or split evenly between the banks.

A high percentage of fish migrated between 10 and 30 m in late June on both banks but with higher water fish became more shore oriented (<10 m) by late July and August (Table 6). By 15 July, ~97% of the fish were passing within 10 m of the transducer along the north bank and ~86% within 10 m of the south bank. By 1 August, ~97% of the fish were within 10 m of the transducer on both banks. For the season, 93% of the fish passed within 10 m of the north bank transducer and 86% were within 10 m of the south bank transducer.

The run along the south bank was nearly the opposite that of the north with the greatest portion of the run occurring after midnight and into the early morning hours, peaking at a time when the north bank run was at its lowest (Figure 4; Appendices B3–B4). This difference might indicate crossing over behavior somewhere downstream of the sonar site.

The fish wheel operated for nearly 745 hours and caught a total of 2,087 salmon for a CPUE of 2.8 fish/h, lower than the historical average of 3.8 fish/hr (Tables 16 and 17). The percentage of sockeye salmon in the catch (~99%) was highest in the history of the project (1983–present).

The fish were more susceptible to capture during the evening and night time hours which may be due to abundance or run timing along the north bank and/or environmental factors. Compared to other glacial rivers, the Kasilof fish wheel CPUE was higher than fish wheel CPUE from Crescent River, about the same as Kenai River and less than Yentna River.

Sockeye salmon escapement age composition was mainly age-2.2 (37.6%) and -1.2 (34.0%) fish with a few -1.3 fish (10.6%) also present ($n = 473$; Table 18). Average lengths were 474 mm for age-2.2, 499 mm for -1.2 and 536 mm for age-1.3 fish (Table 19). Average length for all age classes was 477 mm. The male to female ratio was about average (0.8:1) for this river.

A nearly 1:1 relationship ($R^2 = 0.993$, $SD = 0.8$) existed between observers when counting identical image files (Table 11). Samples averaged 128 fish/file and more than one-half contained between 100 and 200 fish. Unlike the Kenai crew, variability between observers was minimal because of low fish densities, but like the Kenai crew differences increased with higher fish densities (Figure 5). In 2011, observer counts of subsamples containing 300 fish or more ($n = 4$) were most variable ($SD = 5.1\text{--}13.0$), and those subsamples containing <300 fish were least variable ($SD = 0.2\text{--}1.5$). In 2012, the same trend developed with observer counts being less variable for files containing <100 fish ($n = 9$; $SD = 0.3$) compared to those containing 100–199 fish ($n = 14$; $SD = 1.4$). Only one file contained >200 fish ($SD = 3.8$), not enough for comparison purposes. Average observer counts were within 1 or 2 fish of the original counts made in 2011, a good correlation ($R^2 = 0.998\text{--}0.999$) between all observers. Unlike the Kenai River, spatial distribution and acoustic shadowing effects were not a problem for the Kasilof River crew because of low fish densities. A counting standard of $\leq 5\%$ of the crew average was set to allow for some degree of error, and the Kasilof crew met that standard in 2012.

Average water temperature was cooler than the historical average (Table 13) and water level rose 0.9 m during the run, about average for the Kasilof River. The average turbidity indicated clearer water than 2007, the last time turbidity measurements were taken. Environmental factors did not appear to influence salmon run timing although water level influenced fish distribution and fish wheel operations. As water level rose, water velocity increased, so fish took the path of least resistance near the banks. High water and faster current makes operating the fish wheel more difficult and lowers catch efficiency. In 2012, fish wheel CPUE was lower than the historical average which may be a result of higher water clarity, improving visibility and allowing fish to avoid capture.

YENTNA RIVER

The final inriver escapement estimates for Yentna River ranged between 30,000–90,000 sockeye, 168,000–397,000 pink, 15,000–43,000 chum, and 38,000–241,000 coho salmon (Table 20). Between 2010 and 2012, the time frame for operating the escapement project was 7 July–15 August, which adequately coincided with run timing for each of the aforementioned salmon species. Prior to 2010, final apportioned escapement estimates for other salmon were not representative of true escapement strength, because the project ended earlier to match sockeye salmon run timing and not that of other species. Factors influencing the accuracy of escapement estimates for pink, coho, chum, and Chinook salmon in the Yentna River have been discussed by Tarbox et al. (1981, 1983). Escapement range estimates for sockeye salmon were probably a conservative indicator of run strength because of ongoing concerns about sonar limitations and fish wheel selectivity.

The midpoint of the sockeye salmon escapement occurred 24 July which is the historical average for 1981–2011 (Table 21). It took 17 days for 80% of the escapement to pass the Yentna River sonar site, 2 days earlier than the average for 1981–2011. A distinct peak in sockeye salmon escapement occurred on 23 July with 2 lesser peaks on 18 and 26 July (Figure 7). Pink salmon escapement peaked on 27 July, chum salmon on 21 July and coho salmon on 29 July.

The abundance of fish along the south bank (~68–77%) was greater than the north bank in 2012, which was typical for a river that has averaged 79% passage along the south bank (1985–2008; Table 5). South bank run estimates consisted of about 2–3 times more sockeye, 4 times more pink, 3 times more chum and about 2–3 times more coho salmon compared to the north bank (Appendices C1–C2). One possible explanation for bank preference is that most Susitna River fish, at least within 5 miles of the confluence with the Yentna, are oriented to the west bank based on historical Susitna River fish wheel catches and results from a fish wheel selectivity study that concluded in 2012 (Robert DeCino, Commercial Fisheries Biologist, ADF&G, personal communication). It is possible that many of the Susitna west bank fish stay along the south bank after they move into the Yentna River, at least as far as RKM 9.2. This would be especially true of fish bound for spawning streams flowing into the Yentna River from the south rather than anadromous streams flowing into the Yentna River from the north. Fish that spawn in north bank tributaries are the only fish that would need to crossover to the north bank.

Hourly fish passage rates were inconsistent along both banks where a constant rate (4.2%) was exceeded intermittently throughout the early and late morning hours and afternoon/evening hours (Figure 8; Appendices C3–C4). The highest north bank passage rates occurred between midnight and 0300 (29%), at 1100, and 1700–2000 hours. Fish passage on the south bank exceeded a constant rate between 0100 and 0300, 1000, 1200 and between 1400 and 1900. Between 2009 and 2011, the (hourly) passage of salmon was temporarily slowed by near-constant fish wheel operations on both banks (see also Westerman and Willette 2007b). This behavior continued in 2012 with some of the highest fish passage estimates on both banks occurring when the fish wheels were not operating between the hours of midnight and 0400, between 1000–1100, and 1800–1900. Sonar fish passage increased sharply when fish wheels stopped, and then declined when fish wheels were activated. These peaks were not present or as distinct between 2002 and 2004 when fish wheels operated for about one-third the time they did in 2009–2012 (Figure 9). This disruption of fish movement was probably temporary assuming fish did not move offshore and beyond sonar range because of fish wheel activity. The effect this may have had on total daily escapement estimates, if any, is unknown. Fish wheel operations should return to a normal daily regimen of three 2-hour periods to provide for a better comparison between gill net apportioned sonar and mark–recapture estimates of sockeye salmon escapement.

Maintaining sonar and fish wheel operations during high water events has always been a problem on the Yentna River. Earlier examinations of fish wheel efficiency in relation to Bendix sonar counts indicated that as water level increased, fish wheel efficiency improved but sonar counts often decreased. Davis (1998) found that the Yentna River south bank fish wheel efficiency was high when Bendix sonar counts were low, an indication that the south bank counter was undercounting. Westerman and Willette (2007a, 2007b) determined that fish wheel efficiency was significantly positively correlated ($p < 0.05$) with water level in 4 years (2002–2005) on the south bank and in 2 of 4 years on the north bank. These patterns were consistent with changes in fish behavior during periods of high water, apparently causing fish to be more vulnerable to

capture by the fish wheel. A similar event occurred in 2011 and to a lesser extent during the last week of July 2012, when low escapement estimates briefly coincided with rising water levels. A second high water event occurred after the peak of the salmon run during the first week of August, a time when historical runs normally decline.

Most salmon were shore oriented on both banks throughout the season (Table 6) with an average of ~93% (daily) passing within 10 m of the transducer on the north bank and ~95% on the south bank. The percentage of fish nearest shore (1–10 m) was lowest during the first 2 weeks when fish densities were low on both banks but increased after 15 July after densities increased. A few more fish were observed offshore along the north bank after 5 August.

In 2012, the north bank fish wheel caught about 21 salmon per hour (Table 22) with catches consisting mostly of sockeye (5.1%), pink (81.1%), chum (2.0%) and coho salmon (11.6%). Catch percentage for sockeye salmon was less than one-half its historical average for the north bank (Table 23), whereas pink salmon was about 14% higher than its average. The south bank fish wheel CPUE (Table 24) was slightly greater than the north bank, which has been typical for the Yentna River since fish wheels were first used on the river in 1982. The south bank fish wheel averaged nearly 24 salmon per hour with catches consisting mostly of sockeye (7.3%), pink (79.0%), chum (3.7%), and coho salmon (9.9%). Sockeye salmon catch was 20% less than its historical average (Table 25), whereas pink salmon catch was nearly 28% larger. The percentages of chum and coho salmon were similar to historical averages on both banks.

The reliability of using fish wheels to apportion sonar estimates because of possible species selectivity has been a concern in recent years. A study by Meehan (1961) on the Taku River found that fish wheels were more efficient at capturing smaller Chinook and pink salmon and less efficient at capturing coho and larger Chinook salmon. In 1981 and 1982, ADF&G (1983) found that fish wheels on the Susitna River at Talkeetna and Curry Stations were more selective for pink salmon and less for chum and Chinook salmon with no apparent selectivity for coho or sockeye salmon. A big problem with the use of fish wheels is that species selectivity may be dependent on specific site conditions (depth, flow, profile, etc.) where some sites are more conducive to the capture of certain species than others (i.e., eddies might improve capture probabilities of pink salmon over other species). This may be the case with Yentna River fish wheels where environmental factors such as an eddy on the north bank and constantly fluctuating water levels influence species selectivity.

ADF&G conducted a study between 2009 and 2012 to determine the extent Yentna River fish wheels are species selective using methods similar to Meehan. The results from this study will be published and discussed in a separate report. In summary, pink, sockeye, chum, and coho salmon were tagged in the lower Susitna River (Flathorn Station) and recaptured in the Yentna fish wheels to test for differences in recapture probability among species over time. Information from this study will help determine in what manner fish wheels will or will not be used in the future for inseason management of Yentna River escapements.

Test fishing with gill nets was conducted between 16 July and 13 August, to see if this method would be more conducive to sampling Yentna River runs than fish wheels. Netting prior to 16 July was done with only 1 or 2 different nets, mainly to clear potential drift areas of debris or potential snags and to identify the best possible sampling sites along both banks. Nearly 26 hours of test fishing time were logged on the north bank with a total catch of 202 sockeye, 439 pink, 240 chum, 152 coho, and 1 Chinook salmon (Table 26). Nearly 26 hours of fishing time

were also logged along the south bank with a catch total of 192 sockeye salmon, 259 pink salmon, 201 chum salmon, 190 coho salmon and 1 Chinook salmon (Table 27). When data from all nets were pooled by bank, the percentages of sockeye and chum salmon along both banks were relatively similar (19–23%); pink salmon percentages were higher on the north bank (42.5%) than the south bank (30.7%); and coho salmon percentages were higher on the south bank (22.5%) than the north bank (14.7%). Between 16 July and 13 August, gill nets caught a higher percentage of sockeye, chum and coho salmon and about one-half the percentage of pink than were caught in the fish wheels. The species composition for the different mesh sizes was both similar and different depending on bank (Table 28). All 3 mesh sizes caught about the same percentages of sockeye salmon although the 15.2 cm mesh caught the least on the south bank. The 12.1 and 13.0 cm mesh nets caught relatively higher percentages of pink salmon. The 15.2 cm mesh net caught a substantially higher percentage of chum salmon than the smaller mesh nets, and higher percentages of coho salmon were caught by the 12.1 and 13.0 cm mesh nets. Correlations (R^2) between CPUEs by various mesh sizes and between banks are provided in Table 28. Like the fish wheels, CPUE differences were driven by higher percentages pink salmon caught in the smaller meshes.

A preliminary gill net apportioned sonar estimate of about 99,000 sockeye salmon escaped into the Yentna River (Appendix C5). This compared to an estimate of 35,000 sockeye salmon calculated using the standard method (equation 9) of apportionment using daily fish wheel catches. Estimates for the other 3 species also differed significantly. The differences between the 2 methods indicated that the use of gill nets has potential as a management tool for Yentna River salmon stocks. However, we need another 2–3 years of studies and more detailed statistical analysis before making any conclusions.

The age composition of Yentna River sockeye salmon consisted mostly of age-1.3 (43.7%), -2.3 (12.7%), -1.2 (19.4%) and -2.2 (10.7%) fish (Table 29), relatively consistent with the historical average. The average lengths for these age classes ranged between 476 mm and 568 mm and the ratio of males to females was 1.1:1, both consistent with historical data for this river (Table 30).

Observer count variability between members of the Yentna River crew using averages as a comparison baseline is shown in Figure 5 and Table 11. Subsamples contained between 69 and 204 fish/h ($n = 30$), averaging 134 fish per sample. Average counts per observer for all combined samples correlated closely with the crew average ($R^2 = 0.991\text{--}0.998$; SD = 3.7). Unlike the Kenai crew, variability among observers was minimal due to low fish densities, but the trend was similar with variability increasing slightly as fish densities increased. The number of samples containing 200 fish or more ($n = 2$) was adequate to determine any deviation that would be expected to occur at higher densities. Ideally, all observers should be counting subsamples at a 1:1 rate, but observer counting variations of 5% were considered acceptable.

Beginning in 2010 and continuing through 2012, the Yentna River sockeye salmon escapement was not used inseason for management purposes because of uncertainties associated with fish wheel species selectivity. In 2009, a Bendix based Yentna sockeye salmon SEG was replaced with 3 weir SEGs (Fair et al. 2009) for Chelatna, Judd, and Larson lakes, 3 of the major sockeye salmon rearing lakes within the Susitna River drainage (Yanusz et al. 2011). CIAA operated the weirs on these lakes during this time period. Weir counts in 2012 were within the SEG ranges of 20,000 to 65,000 for Chelatna (36,736) and 15,000 to 50,000 for Larson lakes (16,557), and below the SEG range of 25,000 to 55,000 (18,715) for Judd Lake (Table 31). The total sockeye

salmon escapement for Chelatna and Judd was 55,451 sockeye salmon, well within the DIDSON/fish wheel escapement range estimates (30,000–90,000) for Yentna River.

Environmental effects on project operations have been discussed throughout this report. Water temperatures were slightly higher than average for the Yentna River in 2012 (Table 13). Water level fluctuated up to 1.6 m (Figure 10), which was slightly more than average for this river (highest in 2006). Water clarity has always been very low, i.e., less than a few centimeters. In 2012, the crew took a few secchi disk measurements inseason and verified that water clarity was consistently poor and averaged only 3.5 cm. Heavy silt load impairs the DIDSON lenses reducing the visual acuity of images if not cleaned every 2 days, and causing attenuation problems reducing fish detection at longer ranges. Environmental effects on fish wheel operations have already been discussed.

ADF&G has continued to investigate potential errors in total DIDSON salmon abundance estimates. The results from these studies will not be published until after peer review, probably in 2013 or 2014.

CRESCENT RIVER

The 2012 sockeye salmon escapement for Crescent River fell between the lower and upper limits of the BEG for the first time since 2008 and only the second time in the last 10 years, a period when escapements exceeded the upper end of the goal. The Bendix sonar count of 58,838 sockeye salmon was the twenty second highest documented escapement (Table 32) for the Crescent River. Based on fish wheel apportionment, sockeye salmon were 98.3% of the total sonar count with the remainder being pink salmon (0.1%), chum salmon (0.7%), and Dolly Varden (0.9%). The low counts of pink and chum salmon and the complete or nearly complete absence of coho and Chinook salmon were not a good indication of run strength because run timing for these species differs from the sonar operational period. The Crescent River is the only river in UCI where Dolly Varden char are apportioned from the daily counts. In 1993, the first year a fish wheel was used for apportionment, Dolly Varden appeared in the catch in large numbers and were acoustically large enough (350–500 mm) to exceed target detection thresholds (Davis and King 1994). These fish were assumed to be migratory based on 1) morphological characteristics and 2) results from marking studies between 1993 and 1995 (Davis and King 1996). Assuming sonar counts were over apportioned to sockeye salmon prior to this discovery, the error probably was not substantial because estimates for dolly Varden have been <10% since 1993 (<5% since 2000).

In 2012, the midpoint of the escapement occurred on 7 July, 9 days earlier than the historical midpoint (1984–2011; Table 33). Most of the escapement (~80%) occurred within 25 days, which was 2 days less than the average for this river. There was one distinct peak in the sockeye salmon escapement that occurred on 1 July when >7,400 fish passed the sonar counters with lesser peaks on 29 June, 7, 14 and 21 July (Figure 11). Relatively low numbers of sockeye salmon during the first 2 days of operations indicated that few fish had entered the river prior to the start date (24 June). Fish movement along each bank was relatively evenly distributed with ~48% of the fish migrating along the north bank (Table 5; Appendices D1–D2). Hourly escapement timing (per 24 h period) was similar and consistent on both banks (Figure 8) with most fish (>73%, both banks) migrating past the sonar site between the mid-morning and late-evening hours (Appendices D3–D4).

Sockeye salmon passage past the Crescent River sonar counters, located near Cook Inlet (RKM 2.8), was influenced by the tide cycle (Figure 12). As is typical for the Crescent River, 78% of the daily fish passage occurred within a 2–6 hour period following a morning and/or afternoon and evening high tide (average time 4 hours).

The fish were shore oriented along both banks with >90% of the counts within the first 3.6 m of the north bank transducer and >80% of the counts within the first 1.8 m of the south bank (Table 34; Appendices D5–D6). The counting range varied during operations, ranging between 5.2 m and 6.7 m on the north bank and between 3.8 m and 5.2 m on the south bank.

The Crescent River fish wheel captured 559 sockeye salmon out of a total catch of 586 fish (95.4%; Table 35), the second lowest documented catch (Table 36). Although the percentage of sockeye salmon was second highest since 1993, CPUEs for sockeye salmon and for all salmon combined were some of the lowest (seventeenth) documented. Chum salmon (1.9%) and Dolly Varden char (2.4%), about 350 mm to 550 mm in length, were beginning to appear in the fish wheel catch in late July but not in great numbers. Pink, coho and Chinook salmon comprised < 0.2% of the fish wheel catch. Daily fish wheel catches expanded to 24 hours indicated the adjusted catch was about 3.0% of the sonar count along the south bank.

The fish wheel was located next to shore along the south bank because of water depth, velocity, and nearshore fish distribution. The north bank was impractical as a fish wheel site because of shallow water, slower current, and fish dispersal offshore. Water was relatively low and clear during most of the season reducing fish wheel CPUE (Figure 13) and making it difficult to meet apportionment and ASL sampling goals. Secchi disk readings averaged 69.7 cm, the clearest the Crescent River has been since data was first collected in 1989. The highest CPUE (4.5–12.8 fish/hr) occurred 20–23 July when water clarity was lowest for the season (secchi disk = 18–28 cm). For most of the season, fish wheel catches averaged only 2–3 fish/24 h when water clarity measured between 58 and 138 cm. These low CPUEs even occurred during the peak in the migration when turbidity measured 51–64 cm (28 June–3 July).

To compound the poor fish wheel catches, a bear ate fish from the livebox in mid-July forcing the crew to operate the fish wheel for fewer hours and only during the day when catches were usually poorest. An electrified fence and crew vigilance minimized bear activity after the first incident.

In late July, the crew drifted a 13 cm (5.0 in) gill net along the south bank of the river to supplement the weak fish wheel catches and meet ASL goals for sockeye salmon. The net was drifted along the south bank which was more favorable to drifting because of depth and lack of snags. A total of 39 fish (Table 35) were caught in 8 hours of drifting over a 4 day period; 34 (87.2%) fish were sockeye salmon and the rest were pink, chum and Dolly Varden. The percentages of species was relatively similar to average historical fish wheel catches but was slightly different from the poor 2012 fish wheel catches. Use of a gill net to supplement fish wheel catch will have to continue whenever fish wheel CPUE is low and sample sizes are consistently too small. In the future, 3 different mesh sizes, 12.1 cm (4.75 in), 13.0 cm or (5.25 in) 15.2 cm (6.0 in) should be used to reduce gear selectivity.

The sockeye salmon escapement consisted mostly of age-1.3 (52.1%) and -2.3 (25.9%) fish (Table 37) which was typical for the Crescent River. The rest were mostly age-1.2 and -2.2 fish. The average lengths for age-1.3 and -2.3 fish were 536 and 541 mm and for all age classes

ranged between 439 mm and 541 mm. The male to female ratio was ~1.3:1 for the major age classes, consistent with historical ratios for this river (Table 38).

Average water temperature in 2012 was 6.8° C, almost 3° less than the historical average (Table 13). Cooler air and water temperatures meant snow and glacial melt kept water levels down and clearer than usual affecting fish wheel operations (as discussed above). Water level was highest on the first day (Figure 10) of operations but dropped and stayed relatively low for the remainder of the season. Water level did fluctuate some (0.2–1.4 m) during the operational period, slightly less than average for this river, and stayed low enough to allow the crew to operate without problems.

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TABLES

Table 1.—Fish wheel selectivity coefficients for sockeye, pink, chum, and coho salmon from the Susitna River, 1981–1982 (coefficients 1–4) and Taku River in 1958–1959 (coefficients 5–6).

Species	Fish Wheel Selectivity Coefficients						2012 Flathorn
	1	2	3	4	5	6	
Sockeye	0.072	0.134	0.127	0.087	0.033	0.009	0.022
Pink	0.119	0.186	0.174	0.164	0.079	0.083	0.044
Chum	0.060	0.052	0.083	0.046	0.022	0.018	0.018
Coho	0.147	0.110	0.114	0.065	0.007	0.007	0.051

Note: Coefficients 1–4 (ADF&G 1983) and Coefficients 5–6 Taku River (Meehan 1961) 1958–1959. Fish wheel selectivity coefficients are based on tag recapture probabilities.

Table 2.—Sockeye salmon escapement estimates (Bendix and DIDSON) for the Kenai, Kasilof, Crescent, and Yentna rivers 1978–2012.

Year	Kenai R. ^a		Kasilof R. ^b		Crescent R.	Yentna R. ^c	
	Bendix	DIDSON	Bendix	DIDSON		Bendix	DIDSON
1978	398,900	ND	116,600	ND	ND	ND	ND
1979	285,020	412,978	152,179	ND	86,654	ND	ND
1980	464,038	667,458	184,260	ND	90,863	ND	ND
1981	407,639	575,848	256,625	ND	41,213	139,401	236,218
1982	619,831	809,173	180,239	ND	58,957	113,847	192,916
1983	630,340	866,455	210,271	215,731	92,122	104,414	176,932
1984	344,571	481,473	231,685	238,413	118,345	149,375	253,119
1985	502,820	680,897	505,049	512,827	128,628	107,124	181,524
1986	501,157	645,906	275,963	283,054	20,385 ^d	92,076	156,025
1987	1,596,871	2,245,615	249,250	256,707	120,219	66,054	111,930
1988	1,021,469	1,356,958	204,000 ^e	204,336	57,716	52,330	88,674
1989	1,599,959	2,295,576	158,206	164,952	71,064	96,269	163,130
1990	659,520	950,358	144,136	147,663	52,238	140,290	237,725
1991	647,597	954,843	238,269	233,646	44,578	109,632	185,774
1992	994,798	1,429,864	184,178	188,819	58,229	66,074	111,964
1993	813,617	1,134,922	149,939	151,801	37,556	141,694	240,104
1994	1,003,446	1,412,047	205,117	218,826	30,355	128,032	216,953
1995	630,447	884,922	204,935	202,428	52,311	121,220	205,410
1996	797,847	1,129,274	249,944	264,511	28,729	90,660	153,625
1997	1,064,818	1,512,733	266,025	263,780	70,768	157,822	267,433
1998	767,558	1,084,996	273,213	259,045	62,257	119,623	202,704
1999	803,379	1,137,001	312,587	312,481	66,519	99,029	167,807
2000	624,578	900,700	256,053	263,631	56,599	133,094	225,531
2001	650,036	906,333	307,570	318,735	78,082	83,532	141,547
2002	957,924	1,339,682	226,682	235,731	62,833	78,591	133,174
2003	1,181,309	1,656,026	359,633	353,526	122,457	180,813	306,392
2004	1,385,981	1,945,383	577,581	523,653	103,201	71,281	120,787
2005	1,376,452	1,908,821	348,012	360,065	125,623	36,921	62,563
2006	1,499,692	2,064,728	368,092	389,645	92,533	92,896	157,414
2007	867,572	1,229,945	336,866	365,184	79,406	79,901	135,394
2008	614,946	917,139	301,469	327,018	62,030	90,146	152,754
2009	745,170	1,090,055	297,125	326,285	125,114 ^f	ND	43,972–153,910
2010	970,662	1,334,769	267,013	295,265	86,333	ND	59,399–145,139
2011	ND	1,599,217	ND	245,721	81,952	ND	62,231–140,445
2012	ND	1,581,555	ND	374,523	58,838	ND	30,462–89,957

Note: Bendix counts were converted to DIDSON estimates (equivalents) for Kenai (1979–2006) and Kasilof rivers (1983–2007). Estimates after these dates are actual DIDSON generated estimates.

^a Counting began 22 June, 1978–1987, and 1 July (1988–present).

^b Includes counts or estimates prior to 15 June (1978–1988) and post enumeration estimates (1981–1986).

^c The escapement range (2009–2012) based on DIDSON estimates and 1 of 7 possible fish wheel catch scenarios.

^d Counts through 16 July only.

^e Combined counts from weirs on Bear and Glacier Flat Creeks and surveys of remaining spawning streams.

^f Did not conduct escapement project in 2009 because of volcanic activity; estimated from average harvest rates (2001–2008).

Table 3.—Daily sockeye salmon escapement estimates (DIDSON) in the Kenai River, 1 July–16 August 2012.

Date	Sockeye		Pink		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
1 Jul	3,970	3,970	0	0	0	0	0	0
2 Jul	8,970	12,940	0	0	0	0	0	0
3 Jul	7,067	20,007	0	0	0	0	0	0
4 Jul	5,514	25,521	0	0	0	0	0	0
5 Jul	4,913	30,434	0	0	0	0	0	0
6 Jul	3,426	33,860	0	0	0	0	0	0
7 Jul	3,648	37,508	0	0	0	0	0	0
8 Jul	5,466	42,974	0	0	0	0	0	0
9 Jul	6,470	49,444	0	0	0	0	0	0
10 Jul	6,774	56,218	0	0	0	0	0	0
11 Jul	12,054	68,272	0	0	0	0	0	0
12 Jul	9,726	77,998	0	0	0	0	0	0
13 Jul	10,548	88,546	0	0	0	0	0	0
14 Jul	20,214	108,760	0	0	0	0	0	0
15 Jul	119,274	228,034	0	0	0	0	0	0
16 Jul	196,356	424,390	0	0	0	0	0	0
17 Jul	72,726	497,116	0	0	0	0	0	0
18 Jul	31,606	528,722	0	0	0	0	0	0
19 Jul	28,722	557,444	0	0	0	0	0	0
20 Jul	40,230	597,674	0	0	0	0	0	0
21 Jul	97,914	695,588	0	0	0	0	0	0
22 Jul	110,898	806,486	0	0	0	0	0	0
23 Jul	88,255	894,741	0	0	0	0	0	0
24 Jul	51,222	945,963	0	0	0	0	0	0
25 Jul	61,420	1,007,383	0	0	0	0	0	0
26 Jul	61,812	1,069,195	0	0	0	0	0	0
27 Jul	65,250	1,134,445	0	0	0	0	0	0
28 Jul	63,438	1,197,883	0	0	0	0	0	0
29 Jul	69,870	1,267,753	0	0	0	0	0	0
30 Jul	43,494	1,311,247	0	0	0	0	0	0
31 Jul	40,920	1,352,167	0	0	0	0	0	0
1 Aug	24,876	1,377,043	0	0	0	0	0	0
2 Aug	25,284	1,402,327	0	0	0	0	0	0
3 Aug	18,102	1,420,429	0	0	0	0	0	0
4 Aug	16,908	1,437,337	0	0	0	0	0	0
5 Aug	22,080	1,459,417	0	0	0	0	0	0
6 Aug	14,604	1,474,021	0	0	0	0	0	0
7 Aug	10,278	1,484,299	0	0	0	0	0	0
8 Aug	10,764	1,495,063	0	0	0	0	0	0
9 Aug	11,118	1,506,181	0	0	0	0	0	0
10 Aug	13,968	1,520,149	0	0	0	0	0	0
11 Aug	9,560	1,529,709	526	526	0	0	263	263
12 Aug	10,309	1,540,018	2,209	2,735	184	184	0	263
13 Aug	8,273	1,548,291	2,555	5,290	365	549	609	872
14 Aug	13,338	1,561,629	2,541	7,831	0	249	423	1,295
15 Aug	13,709	1,575,338	5,484	13,315	323	872	968	2,263
16 Aug	6,217	1,581,555	11,397	24,712	5,181	6,053	3,108	5,371

Note: Pink, coho and Chinook salmon estimates are not indicative of run strength.

Table 4.—Cumulative proportion by date of sockeye salmon escapement in the Kenai River for the last 16 years, 1997–2012.

Date	Cumulative Proportion															
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
01 Jul	0.003	0.002	0.001	0.003	0.002	0.005	0.005	0.002	0.004	0.001	0.004	0.004	0.003	0.004	0.001	0.003
02 Jul	0.008	0.007	0.002	0.005	0.011	0.013	0.008	0.005	0.010	0.003	0.010	0.009	0.008	0.008	0.004	0.008
03 Jul	0.013	0.010	0.003	0.010	0.017	0.018	0.012	0.007	0.015	0.004	0.015	0.014	0.013	0.011	0.006	0.013
04 Jul	0.020	0.013	0.004	0.015	0.023	0.028	0.017	0.009	0.023	0.006	0.018	0.016	0.020	0.017	0.007	0.016
05 Jul	0.029	0.018	0.005	0.018	0.029	0.057	0.022	0.010	0.033	0.008	0.021	0.018	0.027	0.027	0.010	0.019
06 Jul	0.033	0.025	0.007	0.021	0.033	0.085	0.024	0.011	0.042	0.010	0.025	0.019	0.033	0.038	0.013	0.021
07 Jul	0.037	0.033	0.010	0.028	0.038	0.142	0.028	0.014	0.049	0.012	0.031	0.021	0.041	0.043	0.016	0.024
08 Jul	0.043	0.041	0.015	0.034	0.047	0.181	0.031	0.018	0.058	0.014	0.041	0.022	0.047	0.051	0.019	0.027
09 Jul	0.046	0.052	0.020	0.045	0.056	0.207	0.037	0.020	0.078	0.016	0.051	0.026	0.055	0.057	0.023	0.031
10 Jul	0.067	0.065	0.025	0.059	0.063	0.227	0.046	0.022	0.095	0.019	0.055	0.031	0.062	0.062	0.028	0.036
11 Jul	0.117	0.070	0.027	0.066	0.071	0.239	0.066	0.024	0.121	0.021	0.061	0.034	0.073	0.070	0.030	0.043
12 Jul	0.173	0.074	0.030	0.073	0.075	0.247	0.118	0.026	0.158	0.022	0.066	0.037	0.101	0.085	0.032	0.049
13 Jul	0.235	0.078	0.032	0.113	0.081	0.255	0.154	0.030	0.177	0.024	0.070	0.045	0.117	0.109	0.034	0.056
14 Jul	0.294	0.081	0.037	0.260	0.097	0.265	0.178	0.113	0.189	0.025	0.075	0.049	0.146	0.126	0.038	0.069
15 Jul	0.311	0.087	0.047	0.390	0.141	0.291	0.197	0.215	0.199	0.027	0.083	0.092	0.212	0.150	0.040	0.144
16 Jul	0.347	0.101	0.051	0.464	0.188	0.328	0.273	0.284	0.231	0.036	0.091	0.204	0.288	0.199	0.057	0.268
17 Jul	0.418	0.149	0.064	0.501	0.250	0.356	0.363	0.320	0.276	0.046	0.097	0.288	0.358	0.265	0.202	0.314
18 Jul	0.497	0.184	0.095	0.552	0.295	0.400	0.441	0.344	0.313	0.052	0.108	0.318	0.407	0.336	0.312	0.334
19 Jul	0.503	0.210	0.137	0.591	0.347	0.500	0.501	0.359	0.367	0.056	0.156	0.347	0.442	0.422	0.367	0.352
20 Jul	0.524	0.233	0.163	0.611	0.388	0.565	0.529	0.366	0.394	0.061	0.174	0.396	0.503	0.480	0.438	0.378
21 Jul	0.544	0.247	0.198	0.631	0.410	0.600	0.556	0.389	0.409	0.071	0.210	0.449	0.540	0.530	0.495	0.440
22 Jul	0.554	0.273	0.248	0.650	0.434	0.625	0.614	0.458	0.427	0.093	0.263	0.501	0.552	0.570	0.518	0.510
23 Jul	0.585	0.336	0.307	0.680	0.467	0.653	0.669	0.479	0.465	0.117	0.308	0.518	0.567	0.605	0.585	0.566
24 Jul	0.651	0.397	0.359	0.721	0.525	0.680	0.716	0.503	0.506	0.146	0.347	0.537	0.588	0.622	0.654	0.598
25 Jul	0.661	0.439	0.447	0.759	0.600	0.706	0.742	0.528	0.527	0.181	0.386	0.555	0.599	0.664	0.704	0.637
26 Jul	0.667	0.466	0.517	0.794	0.678	0.740	0.768	0.558	0.541	0.238	0.441	0.567	0.613	0.682	0.753	0.676
27 Jul	0.671	0.497	0.592	0.822	0.731	0.752	0.789	0.584	0.549	0.277	0.512	0.595	0.662	0.700	0.798	0.717
28 Jul	0.675	0.549	0.650	0.847	0.760	0.764	0.823	0.614	0.556	0.317	0.562	0.626	0.715	0.721	0.833	0.757
29 Jul	0.682	0.606	0.689	0.872	0.784	0.777	0.847	0.640	0.565	0.362	0.598	0.662	0.758	0.736	0.856	0.802
30 Jul	0.688	0.647	0.717	0.886	0.812	0.788	0.862	0.658	0.588	0.402	0.621	0.704	0.794	0.750	0.875	0.829
31 Jul	0.694	0.698	0.736	0.897	0.834	0.802	0.877	0.672	0.615	0.435	0.644	0.736	0.830	0.762	0.886	0.855
01 Aug	0.698	0.769	0.759	0.908	0.856	0.815	0.894	0.682	0.633	0.475	0.667	0.772	0.854	0.777	0.900	0.871

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Table 4.—Page 2 of 2.

Date	Cumulative Proportion															
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
02 Aug	0.701	0.857	0.783	0.916	0.879	0.829	0.913	0.695	0.644	0.508	0.684	0.800	0.882	0.801	0.913	0.887
03 Aug	0.705	0.873	0.800	0.930	0.896	0.845	0.930	0.724	0.660	0.535	0.694	0.821	0.911	0.841	0.919	0.898
04 Aug	0.708	0.884	0.817	0.945	0.916	0.861	0.943	0.756	0.673	0.565	0.708	0.844	0.930	0.856	0.926	0.909
05 Aug	0.711	0.895	0.832	0.958	0.929	0.879	0.951	0.777	0.684	0.596	0.729	0.863	0.946	0.867	0.933	0.923
06 Aug	0.723	0.915	0.848	0.969	0.943	0.894	0.966	0.796	0.711	0.616	0.755	0.880	0.955	0.879	0.946	0.932
07 Aug	0.736	0.930	0.872	0.978	0.958	0.910	0.977	0.811	0.735	0.631	0.773	0.893	0.962	0.892	0.957	0.939
08 Aug	0.757	0.943	0.895	0.985	0.972	0.929	0.985	0.819	0.745	0.640	0.788	0.903	0.967	0.904	0.961	0.945
09 Aug	0.774	0.953	0.914	0.992	0.979	0.953	0.992	0.840	0.753	0.649	0.816	0.915	0.973	0.917	0.969	0.952
10 Aug	0.784	0.963	0.923	1.000	0.986	0.972	1.000	0.873	0.760	0.656	0.832	0.931	0.982	0.928	0.979	0.961
11 Aug	0.805	0.975	0.932	0.000	0.989	0.985	0.000	0.904	0.771	0.665	0.857	0.947	0.987	0.934	0.986	0.967
12 Aug	0.822	0.986	0.945	0.000	0.998	0.991	0.000	0.936	0.809	0.681	0.882	0.963	0.992	0.940	0.994	0.974
13 Aug	0.842	1.000	0.953	0.000	1.000	0.996	0.000	0.957	0.853	0.695	0.898	0.974	1.000	0.949	1.000	0.979
14 Aug	0.757	—	0.895	0.985	0.972	0.929	0.985	0.819	0.881	0.640	0.788	0.903	0.967	0.904	—	0.987
15 Aug	0.774	—	0.914	0.992	0.979	0.953	0.992	0.840	0.912	0.649	0.816	0.915	0.973	0.917	—	0.996
16 Aug	0.878	—	0.985	1.000	0.986	0.972	1.000	0.988	0.942	0.752	0.933	0.998	0.982	0.986	—	1.000
17 Aug	0.894	—	0.993	—	0.989	0.985	—	0.996	0.962	0.773	0.944	1.000	0.987	0.992	—	—
18 Aug	0.907	—	1.000	—	0.998	0.991	—	1.000	0.974	0.795	0.953	—	0.992	0.997	—	—
19 Aug	0.921	—	—	—	1.000	0.996	—	—	0.980	0.819	0.966	—	1.000	1.000	—	—
20 Aug	0.933	—	—	—	—	1.000	—	—	0.991	0.844	0.978	—	—	—	—	—
21 Aug	0.945	—	—	—	—	—	—	—	1.000	0.860	0.985	—	—	—	—	—
22 Aug	0.957	—	—	—	—	—	—	—	—	0.882	0.993	—	—	—	—	—
23 Aug	0.970	—	—	—	—	—	—	—	—	0.901	1.000	—	—	—	—	—
24 Aug	0.985	—	—	—	—	—	—	—	—	0.915	—	—	—	—	—	—
25 Aug	1.000	—	—	—	—	—	—	—	—	0.929	—	—	—	—	—	—
26 Aug	—	—	—	—	—	—	—	—	—	0.944	—	—	—	—	—	—
27 Aug	—	—	—	—	—	—	—	—	—	0.860	—	—	—	—	—	—
28 Aug	—	—	—	—	—	—	—	—	—	0.882	—	—	—	—	—	—
29 Aug	—	—	—	—	—	—	—	—	—	0.989	—	—	—	—	—	—
30 Aug	—	—	—	—	—	—	—	—	—	0.996	—	—	—	—	—	—
31 Aug	—	—	—	—	—	—	—	—	—	1.000	—	—	—	—	—	—
Midpoint	19 Jul	28 Jul	26 Jul	17 Jul	24 Jul	19 Jul	19 Jul	24 Jul	24 Jul	2 Aug	27 Jul	22 Jul	20 Jul	21 Jul	22 Jul	22 Jul
Midpoint Ave: (1979–2011):	23 Jul			(1997–2011):	24 Jul											
No. days	56	44	49	47	50	31	47	49	52	62	54	48	50	50	44	47
No. days 80%	39	22	22	20	21	32	22	29	36	32	30	24	22	27	16	21
Average no. days. (1997-2011)	49 d			Average no. days 80% (1997-2011):	26 d											

Note: Data available dating back 1979.

Table 5.—Distribution of sockeye salmon passage by bank (% of total count) in the Kenai, Kasilof, Crescent, and Yentna rivers, 1979–2012.

Year	Kenai River		Kasilof River		Crescent River		Yentna River	
	North	South	North	South	North	South	North	South
1979	72	28	53	47	ND	ND	ND	ND
1980	61	39	52	48	49	51	ND	ND
1981	72	28	69	31	57	43	ND	ND
1982	39	61	73	27	54	46	ND	ND
1983	42	58	51	49	39	61	ND	ND
1984	65	35	56	44	71	28	ND	ND
1985	54	46	70	30	70	30	9	91
1986	62	38	57	43	84	16	32	68
1987	48	52	55	45	64	36	10	90
1988	47	53	32	68	53	47	8	92
1989	57	43	39	61	52	48	12	88
1990	62	38	29	71	44	56	2	98
1991	73	27	39	61	33	67	8	92
1992	60	40	45	55	56	44	5	95
1993	49	51	28	72	41	56	14	86
1994	52	48	47	53	65	35	8	92
1995	52	48	38	62	68	32	11	89
1996	54	46	61	39	68	32	21	79
1997	56	44	41	59	79	21	11	89
1998	55	45	36	64	70	30	49	51
1999	55	45	51	49	53	47	26	74
2000	64	36	51	49	63	37	22	78
2001	50	50	63	37	79	21	38	63
2002	49	51	48	52	74	26	25	75
2003	49	51	50	50	65	35	29	71
2004	49	51	43	57	64	36	6	94
2005	45	55	59	41	65	35	17	83
2006	41	59	67	33	54	46	11	89
2007	50	50	75	25	63	37	16	84
2008	48	52	73	27	60	40	15	85
2009	47	53	74	26	ND	ND	16–19	81–83
2010	51	49	70	30	52	48	17–20	80–82
2011	52	48	71	29	53	47	16–22	78–84
2012	58	42	66	34	48	52	23–31	68–77
Ave. (1979–11)	51	49	57	43	64	36	21	79

Table 6.—Nearshore (<10 m) and offshore (>10 m) distribution of fish from both banks of the Kenai, Kasilof and Yentna rivers based on stratified (weekly) DIDSON subsample counts, 2012.

North Bank												
Dates	Kenai River				Kasilof River				Yentna River			
	1–10 m	%	10–30 m	%	1–10 m	%	10–30 m	%	1–10 m	%	10–30 m	%
15–16 Jun	ND	ND	ND	ND	242	58.1	174	41.9	ND	ND	ND	ND
17–23 Jun	ND	ND	ND	ND	902	52.5	815	47.5	ND	ND	ND	ND
24–30 Jun	ND	ND	ND	ND	2,175	75.9	692	24.1	ND	ND	ND	ND
1 Jul–7 Jul	1,918	49.0	1,995	51.0	1,183	79.4	307	20.6	18	85.7	3	14.3
8 Jul–14 Jul	3,137	41.9	4,351	58.1	1,582	86.6	244	13.4	148	78.2	41	21.8
15 Jul–21 Jul	47,735	77.9	13,573	22.1	14,606	97.7	349	2.3	2,265	82.4	484	17.6
22 Jul–28 Jul	45,682	88.2	6,126	11.8	13,360	98.4	216	1.6	6,549	96.1	269	3.9
29 Jul–4 Aug	17,528	93.8	1,150	6.2	2,728	97.6	66	2.4	6,622	97.7	158	2.3
5 Aug–11 Aug	5,578	80.9	1,314	19.1	1,266	98.7	17	1.3	2,393	88.1	323	11.9
12 Aug–16 Aug	3,137	62.8	1,860	37.2	ND	ND	ND	ND	203	80.0	51	20.0
Total	124,716	80.4	30,369	19.6	38,043	93.0	2,881	7.0	18,197	93.2	1,330	6.8
SD		19.1		19.1		11.0		11.0		9.5		10.7
min		26.8		0.9		47.5		1.0		69.2		0.0
max		99.1		73.2		99.0		52.5		100.0		30.8
South Bank												
Dates	1–10 m	%	10–20 m	%	1–10 m	%	10–30 m	%	1–10 m	%	10–20 m	%
	ND	ND	ND	ND	31	22.3	108	77.7	ND	ND	ND	ND
15–16 Jun	ND	ND	ND	ND	271	35.2	499	64.8	ND	ND	ND	ND
17–23 Jun	ND	ND	ND	ND	2,579	77.2	762	22.8	ND	ND	ND	ND
24–30 Jun	ND	ND	ND	ND	1,801	79.8	455	20.2	14	93.3	1	6.7
1 Jul–7 Jul	2,083	89.1	255	10.9	2,274	87.5	325	12.5	157	79.7	40	20.3
8 Jul–14 Jul	3,299	75.2	1,088	24.8	3,571	86.4	563	13.6	2,922	86.3	465	13.7
15 Jul–21 Jul	35,809	98.1	696	1.9	4,163	93.4	292	6.6	32,209	95.2	1,609	4.8
22 Jul–28 Jul	31,554	98.9	355	1.1	2,546	96.8	83	3.2	19,429	96.4	727	3.6
29 Jul–4 Aug	21,036	99.1	195	0.9	1,168	98.3	21	1.7	5,421	94.0	346	6.0
5 Aug–11 Aug	8,234	95.4	401	4.6	ND	ND	ND	ND	400	91.5	37	8.5
12 Aug–16 Aug	8,559	89.8	976	10.2	ND	ND	ND	ND	ND	ND	ND	ND
Total	110,574	96.5	3,965	3.5	18,404	85.6	3,108	14.4	60,553	94.9	3,224	5.1
SD		7.6		7.6		10.9		10.9		7.5		7.5
min		66.6		0.4		13.9		0.0		70.6		0.0
max		99.6		33.4		100.0		86.1		100.0		29.4

Note: Standard deviation, minimum and maximum percentages were derived from daily counts.

Table 7.—Daily fish wheel catch by species for the Kenai River, 1 July–16 August 2012.

Date	Hours Open	Sockeye		Pink		Chum		Coho		Chinook	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
1 Jul	4.0	0	0	0	0	0	0	0	0	0	0
2 Jul	14.0	18	18	0	0	0	0	0	0	0	0
3 Jul	16.0	15	33	0	0	0	0	0	0	0	0
4 Jul	20.0	2	35	0	0	0	0	0	0	0	0
5 Jul	23.5	8	43	0	0	0	0	0	0	0	0
6 Jul	23.0	8	51	0	0	0	0	0	0	0	0
7 Jul	23.8	3	54	0	0	0	0	0	0	0	0
8 Jul	25.7	0	54	0	0	0	0	0	0	0	0
9 Jul	22.8	2	56	0	0	0	0	0	0	0	0
10 Jul	26.7	5	61	0	0	0	0	0	0	0	0
11 Jul	24.0	3	64	0	0	0	0	0	0	0	0
12 Jul	23.0	4	68	0	0	0	0	0	0	0	0
13 Jul	27.5	12	80	0	0	0	0	0	0	0	0
14 Jul	20.5	3	83	0	0	0	0	0	0	0	0
15 Jul	18.5	94	177	0	0	0	0	0	0	0	0
16 Jul	8.9	142	319	0	0	0	0	0	0	0	0
17 Jul	12.5	85	404	0	0	0	0	0	0	0	0
18 Jul	10.0	24	428	0	0	0	0	0	0	0	0
19 Jul	15.0	20	448	0	0	0	0	0	0	0	0
20 Jul	20.8	48	496	0	0	0	0	0	0	0	0
21 Jul	4.5	58	554	0	0	0	0	0	0	0	0
22 Jul	1.5	61	615	0	0	0	0	0	0	0	0
23 Jul	0.2	78	693	0	0	0	0	0	0	0	0
24 Jul	0.2	59	752	0	0	0	0	0	0	0	0
25 Jul	2.4	65	817	0	0	0	0	0	0	0	0
26 Jul	7.5	56	873	0	0	0	0	0	0	0	0
27 Jul	8.5	43	916	0	0	0	0	0	0	0	0
28 Jul	8.0	110	1,026	0	0	0	0	0	0	0	0
29 Jul	4.0	90	1,116	0	0	0	0	0	0	1	1
30 Jul	2.0	45	1,161	0	0	0	0	0	0	0	1
31 Jul	11.2	50	1,211	0	0	0	0	0	0	2	3
1 Aug	7.5	60	1,271	0	0	0	0	0	0	0	3
2 Aug	7.5	21	1,292	0	0	0	0	0	0	0	3
3 Aug	15.5	42	1,334	0	0	0	0	0	0	0	3
4 Aug	19.0	19	1,353	0	0	0	0	0	0	0	3
5 Aug	19.5	13	1,366	1	1	0	0	0	0	0	3
6 Aug	20.3	19	1,385	0	1	0	0	0	0	0	3
7 Aug	13.0	35	1,420	0	1	0	0	0	0	0	3
8 Aug	15.8	53	1,473	1	2	0	0	0	0	0	3
9 Aug	16.5	100	1,573	2	4	0	0	0	0	0	3
10 Aug	9.7	2	1,575	0	4	0	0	0	0	2	5
11 Aug	20.2	7	1,582	4	8	0	0	0	0	1	6
12 Aug	22.0	56	1,638	12	20	0	0	1	1	0	6
13 Aug	17.0	5	1,643	5	25	0	0	2	3	4	10
14 Aug	24.0	63	1,706	12	37	0	0	0	3	2	12
15 Aug	34.0	85	1,791	34	71	0	0	2	5	6	18
16 Aug	12.8	6	1,797	11	82	0	0	5	10	3	21
% of Total		94.1%		4.3%		0.0%		0.5%		1.1%	
Total: 1,910 salmon			Hrs Operated: 704.6			CPUE: 2.7 fish/hr					

Note: Other fish include 12 rainbow trout and 20 Dolly Varden.

Table 8.—Summary of fish wheel catch and CPUE for the north bank fish wheel at RM 19 on the Kenai River, 1978–2012.

Year	Total Hours	Actual North Bank fish wheel catch (salmon only)						Total Catch	CPUE by species				Total CPUE		
		Sockeye	%	Pink	%	Coho	%	Chinook	%	Sockeye	Pink	Coho	Chinook		
1978	853.9	1,445	87.3	207	12.5	4	0.2	0	0.0	1,656	1.7	0.2	0.0	0.0	1.9
1979	301.0	151	84.8	10	5.6	13	7.3	4	2.2	178	0.5	0.0	0.0	0.0	0.6
1980	967.3	464	29.4	1,103	69.8	12	0.8	1	0.1	1,580	0.5	1.1	0.0	0.0	1.6
1981	1,210.8	496	95.0	21	4.0	3	0.6	2	0.4	522	0.4	0.0	0.0	0.0	0.4
1982	433.5	1,200	99.5	2	0.2	2	0.2	2	0.2	1,206	2.8	0.0	0.0	0.0	2.8
1983	448.0	1,678	99.8	0	0.0	3	0.2	0	0.0	1,681	3.7	0.0	0.0	0.0	3.8
1984	962.4	5,854	98.3	64	1.1	36	0.6	3	0.1	5,957	6.1	0.1	0.0	0.0	6.2
1985	394.8	3,294	98.2	37	1.1	17	0.5	7	0.2	3,355	8.3	0.1	0.0	0.0	8.5
1986	408.5	797	97.8	6	0.7	9	1.1	3	0.4	815	2.0	0.0	0.0	0.0	2.0
1987	493.1	4,795	98.1	18	0.4	59	1.2	17	0.3	4,889	9.7	0.0	0.1	0.0	9.9
1988	528.4	4,393	97.5	73	1.6	18	0.4	21	0.5	4,505	8.3	0.1	0.0	0.0	8.5
1989	357.0	6,341	98.2	69	1.1	28	0.4	16	0.2	6,454	17.8	0.2	0.1	0.0	18.1
1990	363.6	4,270	97.8	46	1.1	24	0.5	26	0.6	4,366	11.7	0.1	0.1	0.1	12.0
1991	393.0	6,732	98.6	49	0.7	25	0.4	19	0.3	6,825	17.1	0.1	0.1	0.0	17.4
1992	392.5	5,526	94.0	224	3.8	96	1.6	33	0.6	5,879	14.1	0.6	0.2	0.1	15.0
1993	515.2	4,631	99.2	16	0.3	10	0.2	10	0.2	4,667	9.0	0.0	0.0	0.0	9.1
1994	673.9	5,600	93.6	290	4.8	65	1.1	29	0.5	5,984	8.3	0.4	0.1	0.0	8.9
1995	799.4	3,022	98.5	14	0.5	10	0.3	22	0.7	3,068	3.8	0.0	0.0	0.0	3.8
1996	376.5	3,835	91.2	264	6.3	82	2.0	22	0.5	4,203	10.2	0.7	0.2	0.1	11.2
1997	553.8	8,886	96.6	21	0.2	266	2.9	30	0.3	9,203	16.0	0.0	0.5	0.1	16.6
1998	350.5	7,755	96.2	173	2.1	99	1.2	34	0.4	8,061	22.1	0.5	0.3	0.1	23.0
1999	400.8	4,600	95.9	108	2.3	56	1.2	33	0.7	4,797	11.5	0.3	0.1	0.1	12.0
2000	499.0	3,020	88.5	205	6.0	146	4.3	40	1.2	3,411	6.1	0.4	0.3	0.1	6.8
2001	446.7	3,309	96.8	36	1.1	30	0.9	45	1.3	3,420	7.4	0.1	0.1	0.1	7.7
2002	610.5	4,073	88.4	461	10.0	54	1.2	18	0.4	4,606	6.7	0.8	0.1	0.0	7.5
2003	317.1	2,749	98.0	20	0.7	12	0.4	25	0.9	2,806	8.7	0.1	0.0	0.1	8.8
2004	461.7	3,299	75.0	843	19.2	225	5.1	31	0.7	4,398	7.1	1.8	0.5	0.1	9.5
2005	184.9	3,140	97.8	27	0.8	28	0.9	16	0.5	3,211	17.0	0.1	0.2	0.1	17.4
2006	635.0	12,285	86.0	1,413	9.9	485	3.4	101	0.7	14,284	19.3	2.2	0.8	0.2	22.5
2007	933.5	6,243	98.1	16	0.3	76	1.2	27	0.4	6,362	6.7	0.0	0.1	0.0	6.8
2008	862.4	5,250	89.9	489	8.4	80	1.4	18	0.3	5,837	6.1	0.6	0.1	0.0	6.8
2009	427.2	1,435	93.9	76	5.0	10	0.7	7	0.5	1,528	3.4	0.2	0.0	0.0	3.6
2010	741.1	2,002	90.2	131	5.9	57	2.6	29	1.3	2,219	2.7	0.2	0.1	0.0	3.0
2011	601.2	1,999	99.0	11	0.5	2	0.1	7	0.3	2,019	3.3	0.0	0.0	0.0	3.4
2012	704.6	1,797	94.1	82	4.3	10	0.5	21	1.1	1,910	2.6	0.1	0.0	0.0	2.7

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Table 8.—Page 2 of 2.

Year	Ave. Hours	Actual North Bank fish wheel catch (salmon only)								Average CPUE by species				
		Average Catch								Sockeye	Pink	Coho	Chinook	Total
Odd	516.3	3,735	97.7	32	0.8	38	1.0	17	0.4	3,823	7.2	0.1	0.1	0.0 7.4
Even	595.3	4,180	90.0	353	7.6	88	1.9	24	0.5	4,645	7.0	0.6	0.1	0.0 7.8
Average (%): (1978–2011)		93.5	—	4.5	—	1.5	—	0.5	—		7.1	0.3	0.1	0.0 7.6
Minimum (%): (1978–2011)		29.4	—	0.0	—	0.1	—	0.0	—		0.4	0.0	0.0	0.0 0.4
Maximum (%): (1978–2011)		99.8	—	69.8	—	7.3	—	2.2	—		22.1	2.2	0.8	0.2 23.0
Std. Dev. (%): (1978–2011)		12.4	—	12.1	—	1.6	—	0.4	—		5.8	0.5	0.2	0.0 6.1

Table 9.—Age composition of sockeye salmon sampled from the Kenai River fish wheel, 1970–2012.

Year	Percentage Composition by Age Class								Sample Size
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	Other	
1970	0.0	10.0	17.0	0.0	26.0	25.0	15.0	6.0	225
1971	0.0	8.0	39.0	1.0	3.0	38.0	11.0	0.0	168
1972	0.0	21.0	34.0	0.0	0.0	23.0	20.0	0.0	403
1973	0.0	5.0	68.0	1.0	1.0	8.0	16.0	0.0	632
1974	2.0	18.0	46.0	0.0	3.0	18.0	12.0	0.0	295
1975	2.0	10.0	36.0	2.0	4.0	31.0	14.0	1.0	162
1976	1.0	46.0	20.0	0.0	2.0	22.0	8.0	1.0	948
1977	0.0	6.0	76.0	1.0	0.0	7.0	10.0	0.0	1,265
1978	0.0	2.5	86.7	0.0	0.0	4.9	5.4	0.0	811
1979	0.2	19.6	63.0	0.0	0.0	10.6	6.6	0.0	601
1980	6.1	35.4	36.7	0.0	0.9	14.4	6.5	0.0	557
1981	0.0	19.7	66.4	0.0	0.5	7.9	5.3	0.2	624
1982	0.1	5.8	87.5	0.0	0.0	2.9	3.7	0.0	1,787
1983	0.3	8.4	79.0	0.3	0.5	2.2	8.9	0.4	1,765
1984	0.0	23.1	37.8	3.6	0.5	13.2	19.5	2.3	2,067
1985	0.1	15.9	56.4	0.3	0.1	14.7	11.4	1.1	2,201
1986	0.0	31.8	39.5	0.7	0.3	8.2	18.0	1.5	789
1987	0.0	12.8	78.4	0.1	0.0	3.2	5.2	0.3	745
1988	0.3	11.6	74.2	0.4	0.2	3.1	10.2	0.0	1,420
1989	0.2	5.6	26.7	0.9	0.8	7.6	57.4	0.8	1,587
1990	0.6	21.6	41.4	0.6	0.3	13.7	21.1	0.7	1,513
1991	0.1	48.2	31.6	0.2	0.4	5.7	11.4	2.4	2,502
1992	0.0	2.7	79.9	0.2	0.3	5.9	11.0	0.0	1,338
1993	0.3	12.2	30.5	2.6	6.3	6.4	41.2	0.5	2,088
1994	0.3	6.6	61.1	0.8	0.8	17.8	12.1	0.5	1,341
1995	0.3	31.9	26.4	0.4	2.4	6.6	31.3	0.7	712
1996	0.0	10.8	75.4	0.3	0.7	6.1	5.4	1.3	684
1997	0.1	7.6	75.2	0.4	0.4	2.8	13.0	0.5	963
1998	0.3	27.1	40.7	1.3	6.6	9.6	13.9	0.5	700
1999	0.0	15.1	55.4	0.4	1.2	16.8	9.6	1.5	733
2000	0.0	15.3	55.1	1.0	2.6	9.4	14.5	2.1	560
2001	0.3	10.8	68.9	0.8	1.5	8.3	9.2	0.2	601
2002	0.0	23.0	58.4	0.7	0.7	10.6	6.1	0.5	2,441
2003	0.0	14.4	57.9	0.4	0.1	8.0	18.7	0.5	1,555
2004	0.0	10.1	69.1	0.2	0.2	8.2	11.1	1.1	1,275
2005	0.0	2.8	81.3	0.3	0.2	2.8	11.8	0.8	1,893
2006	0.0	9.9	38.7	2.4	0.4	3.7	44.0	0.9	1,315
2007	0.0	5.9	78.8	1.5	0.7	4.4	7.8	0.9	759
2008	0.0	15.2	60.9	4.6	0.7	7.2	10.9	0.5	567
2009	0.3	6.1	72.6	0.9	0.1	9.8	9.7	0.4	701
2010	0.2	23.4	44.4	0.2	2.8	4.7	23.9	0.4	855
2011	0.1	8.0	38.9	0.4	1.1	5.4	45.6	0.4	791
2012	0.5	12.4	45.1	1.7	0.2	15.5	24.6	0.0	419
Ave. (1970–11)	0.4	15.4	55.0	0.8	1.7	10.4	15.4	0.8	1,070

Table 10.—Average lengths of the major age classes of sockeye salmon sampled from the Kenai River fish wheel, 1980–2012.

Year	Age Class	Male		Female		Both		Ratio Male: Female	Age Class	Male		Female		Both		Ratio Male: Female
		Length (mm)	n	Length (mm)	n	Length (mm)	n			Length (mm)	n	Length (mm)	n	Length (mm)	n	
1980	1.2	482	168	494	100	486	268	1.7:1	1.3	580	180	561	192	570	372	0.9:1
1981		493	85	513	73	501	158	1.2:1		590	290	569	430	575	720	0.7:1
1982		483	70	505	32	490	102	2.2:1		596	723	572	841	583	1,564	0.9:1
1983		524	25	520	30	522	55	0.8:1		598	215	577	269	586	484	0.8:1
1984		474	280	473	196	474	476	1.4:1		582	385	559	395	571	780	1.0:1
1985		492	184	490	186	491	370	1.0:1		575	496	552	824	560	1,320	0.6:1
1986		488	155	492	96	489	251	1.6:1		584	112	564	200	571	312	0.6:1
1987		513	39	502	56	507	95	0.7:1		604	183	586	401	591	584	0.5:1
1988		521	79	511	84	516	163	0.9:1		598	428	572	624	583	1,052	0.7:1
1989		464	51	463	40	463	91	1.3:1		592	213	565	218	578	431	1.0:1
1990		474	168	478	127	476	295	1.3:1		586	358	559	318	574	676	1.1:1
1991		488	613	497	577	492	1,190	1.1:1		561	357	539	441	549	798	0.8:1
1992		480	13	462	25	468	38	0.5:1		573	370	549	714	557	1,084	0.5:1
1993		474	123	481	132	477	255	0.9:1		583	247	556	390	566	637	0.6:1
1994		452	46	462	42	457	88	1.1:1		579	367	552	452	564	819	0.8:1
1995		492	116	487	111	489	227	1.0:1		584	81	564	107	572	188	0.8:1
1996		507	47	519	27	511	74	1.7:1		607	243	589	273	597	516	0.9:1
1997		480	34	489	39	485	73	0.9:1		593	372	571	352	582	724	1.1:1
1998		483	95	494	95	488	190	1.0:1		577	146	547	139	562	285	1.1:1
1999		490	72	488	39	490	111	1.8:1		600	202	576	204	588	406	1.0:1
2000		513	47	513	43	513	90	1.1:1		605	159	584	165	594	324	1.0:1
2001		522	35	507	30	515	65	1.2:1		596	196	577	218	586	414	0.9:1
2002		503	306	502	256	503	562	1.2:1		606	665	580	760	592	1,425	0.9:1
2003		483	116	466	117	474	233	1.0:1		593	387	574	504	582	891	0.8:1
2004		497	64	482	65	489	129	1.0:1		585	396	569	485	576	881	0.8:1
2005		483	27	495	30	490	57	0.9:1		588	649	564	883	574	1,532	0.7:1
2006		498	72	497	58	497	130	1.2:1		572	239	553	270	562	509	0.9:1
2007		512	21	499	24	505	45	0.9:1		594	313	567	285	581	598	1.1:1
2008		472	45	465	41	468	86	1.1:1		595	160	576	185	585	345	0.9:1
2009		482	24	492	19	486	43	1.3:1		594	206	578	303	584	509	0.7:1
2010		474	121	493	79	481	200	1.5:1		578	163	568	217	573	380	0.8:1
2011		462	35	479	28	470	63	1.3:1		591	124	568	184	577	308	0.7:1
2012		461	36	474	16	465	52	2.3:1		592	81	569	108	579	189	0.7:2
Ave. (1980–2011)		488	106	491	91	489	200	1.2:1		589	301	566	383	576	695	0.8:1

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Table 10.–Page 2 of 2.

Year	Age Class	Male		Female		Both		Ratio Male: Female	Age Class	Male		Female		Both		Ratio Male: Female
		Length (mm)	n	Length (mm)	n	Length (mm)	n			Length (mm)	n	Length (mm)	n	Length (mm)	n	
1980	2.2	525	13	534	35	532	48	0.4:1	2.3	589	67	579	80	585	147	0.8:1
1981		ND	ND	ND	ND	525	ND	ND		ND	ND	ND	ND	588	ND	ND
1982		530	21	522	30	525	51	0.7:1		598	46	580	21	592	67	2.2:1
1983		524	25	520	30	522	55	0.8:1		595	26	582	35	587	61	0.7:1
1984		505	116	508	159	507	275	0.7:1		570	210	557	192	564	402	1.1:1
1985		513	132	513	196	513	328	0.7:1		570	106	555	129	562	235	0.8:1
1986		ND	ND	ND	ND	ND	ND	ND		585	52	568	89	575	141	0.6:1
1987		510	11	517	13	514	24	0.8:1		608	15	583	24	593	39	0.6:1
1988		527	20	527	24	527	44	0.8:1		596	53	577	92	584	145	0.6:1
1989		499	47	505	73	503	120	0.6:1		605	402	579	501	591	903	0.8:1
1990		494	88	496	113	495	201	0.8:1		589	177	568	132	580	309	1.3:1
1991		497	68	486	89	491	157	0.8:1		572	153	543	139	558	292	1.1:1
1992		485	31	485	44	485	75	0.7:1		570	46	547	88	555	134	0.5:1
1993		514	58	519	76	517	134	0.8:1		583	357	560	503	570	860	0.7:1
1994		481	67	488	171	486	238	0.4:1		578	73	551	89	563	162	0.8:1
1995		504	23	521	24	513	47	1.0:1		588	114	569	109	578	223	1.0:1
1996		511	18	520	24	516	42	0.8:1		606	18	598	19	602	37	0.9:1
1997		489	12	504	15	498	27	0.8:1		600	52	567	73	581	125	0.7:1
1998		501	28	507	39	504	67	0.7:1		574	48	559	49	566	97	1.0:1
1999		517	38	512	85	513	123	0.4:1		592	37	574	33	583	70	1.1:1
2000		519	35	518	20	519	55	1.8:1		603	44	583	41	593	85	1.1:1
2001		519	14	538	36	533	50	0.4:1		600	26	579	29	588	55	0.9:1
2002		515	117	513	142	514	259	0.8:1		604	75	579	74	591	149	1.0:1
2003		514	45	515	73	515	118	0.6:1		594	135	574	163	583	298	0.8:1
2004		513	34	512	71	512	105	0.5:1		596	71	566	71	581	142	1.0:1
2005		499	20	508	39	505	59	0.5:1		582	110	561	111	572	221	1.0:1
2006		521	17	523	31	522	48	0.5:1		577	250	557	329	566	579	0.8:1
2007		517	11	520	22	519	33	0.5:1		587	26	568	33	576	59	0.8:1
2008		489	14	504	27	499	41	0.5:1		589	37	572	25	582	62	1.5:1
2009		506	26	534	43	524	69	0.6:1		591	29	578	39	583	68	0.7:1
2010		488	27	498	13	491	40	2.1:1		591	75	568	129	576	204	0.6:1
2011		479	24	518	19	496	43	1.3:1		596	161	572	200	583	361	0.8:1
2012		496	29	518	36	508	65	0.8:1		594	47	568	56	580	103	0.8:1
Ave. (1980–2011)		506	41	509	61	508	101	0.7:1		588	98	566	115	576	212	0.9:1
2012 (all ages)		569	353	561	438	565	791	0.8:1								

Table 11.—Kenai (top), Kasilof (middle) and Yentna rivers (bottom) observer count variability.

Kenai R. crew	Abundance	n	Observer: 1	2	3	4	5	2012 Ave.	SD	2011 Ave.
Average	<100	2	68	73	73	73	71	71	2.3	78
	100–199	2	126	129	124	128	127	127	2.0	148
	200–299	2	223	220	232	237	239	230	8.4	245
	0–299	6	139	141	143	146	146	143	3.1	157
R ²			0.9978	0.9914	0.9961	0.9982	0.9991	—	—	0.9686
Average	300–399	3	301	336	326	344	324	326	16.0	341
	400–499	2	490	447	471	477	486	474	17.0	458
	500–599	6	569	535	537	565	540	549	16.4	581
	300–599	11	481	464	467	489	471	475	10.1	493
R ²			0.8609	0.9336	0.9407	0.9442	0.9579	—	—	0.9535
Average	600–699	5	617	646	686	653	622	645	27.6	642
	700–799	5	705	700	734	729	728	719	15.6	700
	800–899	5	893	896	841	889	869	877	23.0	931
	600–899	15	739	747	754	757	740	747	8.2	758
R ²			0.8916	0.8295	0.7482	0.8852	0.9416	—	—	0.8146
Average	>900	3	1,278	1,198	1,199	1,195	1,183	1,211	38.3	1,095
R ²			0.9558	0.9938	0.9854	0.9639	0.9974	—	—	0.6879
Average		35	601	593	597	606	591	598	5.8	600
R ² (average-obs)			0.9746	0.9873	0.9855	0.9823	0.9942	—	—	0.9143
dif from average			3.5	-4.6	-0.6	7.9	-6.2	—	—	2.9

Kasilof R. crew			Observer 1	2	3	4	5	2012 ave	SD	2011 Ave.
Average	<99	9	75	76	75	—	—	75	0.3	74
R ²			0.9941	0.9875	0.9964	—	—	—	—	0.9630
Average	100–199	14	154	156	156	—	—	155	1.4	154
R ²			0.9942	0.9987	0.9940	—	—	—	—	0.9861
Average	>200	1	225	219	218	—	—	221	3.8	223
Average	All	24	127	128	128	—	—	128	0.8	127
R ² (average-obs)			0.9981	0.9992	0.9985	—	—	—	—	0.9928
dif from average			-0.9	0.5	0.4	—	—	—	—	-1

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Yentna R. crew	Abundance	n	Observer 1	2	3	4	5	2012 ave	SD	2010 Ave.
Average	<99	6	68	69	71	67	–	69	2.1	68
R ²			0.9962	0.9985	0.9806	0.9940	–	0.9918	–	0.9980
Average	100–199	22	142	147	151	143	–	146	4.2	147
R ²			0.9874	0.9926	0.9662	0.9798	–	0.9821	–	0.9669
Average	>200	2	202	206	208	200	–	204	3.5	211
R ²			–	–	–	–	–	–	–	–
Average		30	131	135	139	131	–	134	3.7	136
R ² (average-obs)			0.9960	0.9979	0.9906	0.9941	–	–	–	0.9909
dif from average			-3	1	5	-3	–	–	–	2

Note: The R² values are crew averages compared to observer counts and original counts made in 2010 (Yentna) or 2011 (Kenai and Kasilof).

Table 12.—Late run sockeye salmon weir and ground survey counts in 4 index streams in the Kenai River drainage, 1969–2012.

Year	Ptarmigan Creek	Russian River					
		Quartz Creek		Hidden Lake	Above Weir	Below Weir	Area Index
		Ground	Weir		Weir	Ground	
1969	ND	ND	487	500	28,872	1,100	30,959
1970	ND	ND	200	323	26,200	222	26,945
1971	45	ND	808	1,958	54,421	11,442	68,674
1972	ND	ND	ND	4,956	79,115	7,113	91,184
1973	1,041	ND	3,173	690	25,068	6,680	36,652
1974	558	ND	288	1,150	24,904	2,210	29,110
1975	186	ND	1,068	1,375	31,961	690	35,280
1976	505	ND	3,372	4,860	31,939	3,470	44,146
1977	1,513	ND	3,037	1,055	21,362	17,090	44,057
1978	3,529	ND	10,627	4,647	34,334	18,330	71,467
1979	532	ND	277	5,762	87,852	3,920	98,343
1980	5,752	ND	7,982	27,448	83,984	3,220	128,386
1981	1,421	ND	5,998	15,939	44,523	4,160	72,041
1982	7,525	70,540	ND	9,790	30,790	45,000	163,645
1983	9,709	73,345	ND	11,297	33,734	44,000	172,085
1984	18,000	37,659	ND	27,784	92,659	3,000	179,102
1985	26,879	ND	ND	24,784	136,969	8,650	197,282
1986	ND	ND	ND	17,530	40,281	15,230	73,041
1987	14,187	ND	45,400	43,487	53,932	76,530	233,536
1988	31,696	ND	ND	50,907	42,476	30,360	155,439
1989	3,484	ND	ND	7,770	138,377	28,480	178,111
1990	2,230	ND	ND	77,959	83,434	11,760	175,383
1991	4,628	ND	ND	35,576	78,175	22,267	105,070
1992	3,147	ND	ND	32,912	62,584	4,980	103,623
1993	ND	ND	ND	11,582	99,259	12,258	123,099
1994	1,077	ND	ND	6,086	122,277	15,211	144,651
1995	ND	ND	1,372	7,542	61,982	12,479	83,375
1996	ND	ND	4,181	55,256	34,691	31,601	125,729
1997	ND	ND	27,660	56,053	65,905	11,337	160,955
1998	ND	ND	11,130	67,727	113,480	19,593	211,930
1999	ND	ND	3,951	49,406	139,863	19,514	212,734
2000	ND	ND	1,389	45,685	56,580	13,930	117,584
2001	ND	ND	4,792	42,462	74,964	17,044	139,262
2002	ND	ND	66,294	71,983	62,115	6,858	140,956
2003	ND	ND	19,106	11,734	157,469	27,474	215,783
2004	4,428	ND	13,225	18,172	110,244	30,458	176,527
2005	3,036	ND	6,580	13,000 ^a	59,473	29,048	98,137
2006	3,461	ND	28,335	38,535	89,160	18,452	177,943
2007	1,938	ND	38,954	16,734	53,068	4,504	115,198
2008	5,530	ND	16,622	15,214	46,638	9,750	93,754
2009	3,980	ND	11,262	11,011	80,088	10,740	117,081
2010	2,184	ND	5,098	41,503	38,848	16,656	104,289
2011	ND	ND	8,779	17,771	41,529	35,415	103,494
2012	1,166	ND	14,093	29,789	54,911	25,471	125,430

^a Count is incomplete, hole discovered in weir on 8/11.

Table 13.—Mean annual water level gain, turbidity (secchi depth), air and water temperature measured at the Kasilof, Kenai, Crescent, and Yentna river sonar sites, 1979–2012.

Year	Kasilof River				Kenai River			
	Water Level Gain (m)	Secchi disk (cm)	Air °C	Water °C	Water Level Gain (m)	Secchi disk (cm)	Air °C	Water °C
1979	ND	ND	ND	ND	ND	ND	ND	ND
1980	ND	ND	ND	ND	ND	ND	ND	ND
1981	ND	ND	ND	ND	ND	ND	ND	ND
1982	1.0	ND	12.0	10.2	0.5	ND	14.2	9.3
1983	ND	ND	ND	ND	0.4	ND	ND	12.6
1984	0.6	ND	ND	14.4	0.5	ND	ND	12.5
1985	0.8	ND	ND	13.0	ND	ND	ND	ND
1986	1.3	ND	ND	11.0	ND	ND	ND	ND
1987	ND	ND	ND	ND	0.4	ND	14.7	9.3
1988	ND	ND	ND	ND	0.3	ND	15.8	11.8
1989	1.3	ND	16.6	13.3	0.8	73.9	15.1	6.8
1990	0.8	ND	17.2	15.0	0.5	77.7	15.0	12.6
1991	0.6	ND	15.7	13.3	0.2	89.9	13.4	12.8
1992	0.8	ND	18.0	13.0	0.5	88.9	15.0	12.0
1993	0.9	ND	19.0	16.2	0.7	99.8	16.6	13.0
1994	1.5	ND	17.1	13.2	0.4	87.6	14.3	11.4
1995	0.9	ND	16.0	12.5	0.4	101.6	14.1	11.1
1996	1.0	ND	16.0	13.0	0.8	52.3	13.6	12.1
1997	1.2	ND	19.0	16.0	0.3	66.5	14.0	14.0
1998	0.9	ND	13.6	16.5	0.5	69.1	13.4	12.0
1999	1.0	ND	13.4	14.6	0.4	74.2	13.9	12.5
2000	1.0	ND	11.3	14.6	0.4	77.7	13.3	11.6
2001	0.7	ND	18.6	15.5	0.4	80.0	13.8	12.4
2002	1.1	ND	17.8	9.1	0.3	99.3	15.0	12.6
2003	1.1	ND	17.1	10.4	0.5	58.4	15.1	12.3
2004	1.1	ND	19.9	13.5	0.5	83.3	16.1	14.3
2005	0.9	ND	19.6	14.8	0.2	109.2	14.1	14.2
2006	0.9	ND	16.7	12.5	0.4	107.7	13.0	11.7
2007	1.0	50.4	17.9	14.9	0.4	85.3	13.6	12.5
2008	0.9	ND	16.0	11.3	0.4	92.7	12.5	10.6
2009	1.2	ND	17.0	12.3	1.1	74.1	13.8	12.5
2010	0.9	ND	15.8	12.2	0.4	99.1	13.2	10.2
2011	1.1	ND	17.5	12.8	0.6	86.7	12.3	13.8
2012	0.9	74.3	16.4	11.4	0.3	108.7	10.4	13.0

Summary 1979–11

Ave	1.0	ND	16.6	13.3	0.5	84.1	14.2	11.9
Min	0.6	ND	11.3	9.1	0.2	52.3	12.3	6.8
Max	1.5	ND	19.9	16.5	1.1	109.2	16.6	14.3

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Year	Crescent River				Yentna River			
	Water Level Gain (m)	Secchi disk (cm)	Air °C	Water °C	Water Level Gain (m)	Secchi disk (cm)	Air °C	Water °C
1979	0.6	ND	ND	9.1	ND	ND	ND	ND
1980	ND	ND	ND	ND	ND	ND	ND	ND
1981	0.4	ND	10.6	19.2	ND	ND	ND	ND
1982	0.2	ND	9.6	18.1	ND	ND	ND	ND
1983	0.4	ND	14.0	7.4	ND	ND	ND	ND
1984	0.2	ND	18.1	9.6	ND	ND	ND	ND
1985	0.8	ND	14.0	7.2	0.8	ND	13.9	ND
1986	1.4	ND	12.4	8.9	1.4	ND	12.5	8.9
1987	ND	ND	ND	ND	ND	ND	ND	ND
1988	ND	ND	ND	ND	ND	ND	ND	ND
1989	0.5	26.2	15.0	8.5	1.5	ND	12.6	8.7
1990	0.4	23.1	15.3	10.6	ND	ND	ND	ND
1991	0.2	35.9	12.0	12.6	1.2	ND	8.3	8.6
1992	0.5	45.0	12.4	7.8	1.2	ND	9.6	8.1
1993	0.4	42.9	12.3	9.2	1.2	ND	13.2	9.8
1994	0.7	45.2	11.8	7.4	0.8	ND	11.7	9.1
1995	0.6	37.3	11.6	8.9	1.4	ND	11.9	9.1
1996	0.3	31.5	12.5	10.3	1.2	ND	10.4	9.2
1997	0.4	15.0	15.0	11.6	1.0	ND	17.2	9.7
1998	0.7	40.1	10.8	7.3	1.1	ND	15.8	8.9
1999	0.5	36.8	15.0	9.4	1.1	ND	14.1	9.4
2000	0.4	47.0	16.7	9.5	1.5	ND	13.2	9.5
2001	0.4	30.2	14.9	8.9	1.4	ND	13.4	9.3
2002	0.3	37.6	14.3	8.2	1.4	ND	13.9	10.4
2003	0.6	40.1	14.9	9.3	1.6	ND	17.2	9.9
2004	0.6	20.3	14.2	9.9	1.0	ND	13.1	9.9
2005	0.5	22.9	14.0	9.9	1.3	ND	12.1	10.3
2006	0.5	33.0	12.5	9.1	2.1	ND	7.3	9.6
2007	0.4	42.2	12.0	9.2	1.4	ND	7.4	10.0
2008	0.3	58.4	10.9	8.2	1.7	ND	6.2	8.8
2009	ND	ND	ND	ND	1.6	ND	6.2	9.4
2010	0.5	44.8	11.1	7.4	1.4	ND	8.6	7.0
2011	0.3	47.6	13.9	8.3	1.8	ND	6.1	9.6
2012	0.5	69.7	10.9	6.8	1.6	3.5	6.2	9.9
Summary 1979–11								
Ave	0.5	36.5	13.3	9.7	1.3	ND	11.5	9.3
Min	0.2	15.0	9.6	7.2	0.8	ND	6.2	7.0
Max	1.4	58.4	18.1	19.2	2.1	ND	17.2	10.4

Note: Crescent did not operate in 2009 because of volcanic activity.

Table 14.—Daily (DIDSON) estimates of the sockeye salmon escapement into the Kaslof River, 2012.

Sockeye Salmon					
Date	Daily	Cum	Date	Daily	Cum
15 Jun	2,658	2,658	15 Jul	25,146	129,672
16 Jun	672	3,330	16 Jul	29,100	158,772
17 Jun	672	4,002	17 Jul	3,030	161,802
18 Jun	1,434	5,436	18 Jul	7,824	169,626
19 Jun	1,974	7,410	19 Jul	7,416	177,042
20 Jun	2,598	10,008	20 Jul	12,756	189,798
21 Jun	3,552	13,560	21 Jul	29,262	219,060
22 Jun	2,382	15,942	22 Jul	19,278	238,338
23 Jun	2,310	18,252	23 Jul	6,264	244,602
24 Jun	3,414	21,666	24 Jul	7,098	251,700
25 Jun	2,898	24,564	25 Jul	26,598	278,298
26 Jun	3,714	28,278	26 Jul	20,890	299,188
27 Jun	6,492	34,770	27 Jul	18,312	317,500
28 Jun	8,700	43,470	28 Jul	9,655	327,155
29 Jun	5,190	48,660	29 Jul	7,152	334,307
30 Jun	6,840	55,500	30 Jul	5,844	340,151
1 Jul	5,610	61,110	31 Jul	5,316	345,467
2 Jul	5,904	67,014	1 Aug	4,332	349,799
3 Jul	5,100	72,114	2 Aug	3,420	353,219
4 Jul	1,302	73,416	3 Aug	3,024	356,243
5 Jul	1,776	75,192	4 Aug	3,450	359,693
6 Jul	630	75,822	5 Aug	2,922	362,615
7 Jul	2,154	77,976	6 Aug	2,149	364,764
8 Jul	2,772	80,748	7 Aug	2,172	366,936
9 Jul	2,952	83,700	8 Aug	1,602	368,538
10 Jul	4,026	87,726	9 Aug	1,335	369,873
11 Jul	3,228	90,954	10 Aug	1,320	371,193
12 Jul	2,736	93,690	11 Aug	1,188	372,381
13 Jul	4,224	97,914	12 Aug	1,044	373,425
14 Jul	6,612	104,526	13 Aug	1,098	374,523

Table 15.—Cumulative proportion by date of sockeye salmon escapement into the Kaslof River, 1998–2012.

Date	Cumulative Proportion														
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
15 Jun	0.001	0.002	0.001	0.006	0.027	0.004	0.007	0.022	0.009	0.012	0.001	0.008	0.009	0.022	0.007
16 Jun	0.003	0.004	0.002	0.020	0.039	0.007	0.010	0.043	0.013	0.025	0.002	0.015	0.014	0.035	0.009
17 Jun	0.006	0.007	0.004	0.043	0.051	0.009	0.013	0.073	0.018	0.033	0.004	0.018	0.016	0.043	0.011
18 Jun	0.016	0.009	0.010	0.064	0.067	0.011	0.017	0.115	0.023	0.039	0.005	0.022	0.018	0.054	0.015
19 Jun	0.029	0.012	0.015	0.085	0.095	0.017	0.022	0.164	0.030	0.045	0.008	0.028	0.021	0.078	0.020
20 Jun	0.036	0.016	0.022	0.097	0.119	0.032	0.034	0.211	0.039	0.051	0.018	0.049	0.023	0.099	0.027
21 Jun	0.048	0.025	0.027	0.110	0.138	0.053	0.053	0.238	0.054	0.057	0.031	0.060	0.031	0.121	0.036
22 Jun	0.065	0.038	0.040	0.124	0.157	0.065	0.092	0.246	0.065	0.067	0.049	0.065	0.048	0.144	0.043
23 Jun	0.082	0.055	0.055	0.146	0.174	0.092	0.138	0.251	0.076	0.079	0.074	0.073	0.086	0.190	0.049
24 Jun	0.094	0.072	0.075	0.174	0.185	0.113	0.187	0.261	0.087	0.086	0.090	0.084	0.121	0.235	0.058
25 Jun	0.107	0.099	0.096	0.210	0.194	0.128	0.222	0.283	0.104	0.094	0.111	0.104	0.143	0.272	0.066
26 Jun	0.124	0.120	0.122	0.229	0.212	0.152	0.224	0.303	0.124	0.096	0.161	0.116	0.169	0.275	0.076
27 Jun	0.152	0.147	0.147	0.258	0.230	0.155	0.226	0.316	0.144	0.103	0.187	0.137	0.200	0.285	0.093
28 Jun	0.181	0.181	0.169	0.294	0.233	0.156	0.232	0.329	0.164	0.119	0.213	0.142	0.207	0.290	0.116
29 Jun	0.212	0.216	0.202	0.307	0.235	0.165	0.239	0.355	0.184	0.122	0.221	0.153	0.218	0.315	0.130
30 Jun	0.224	0.244	0.233	0.330	0.239	0.188	0.247	0.361	0.191	0.123	0.236	0.166	0.244	0.318	0.148
01 Jul	0.252	0.277	0.264	0.344	0.266	0.197	0.250	0.385	0.197	0.128	0.243	0.199	0.252	0.330	0.163
02 Jul	0.276	0.291	0.301	0.375	0.280	0.214	0.253	0.421	0.211	0.139	0.253	0.214	0.260	0.357	0.179
03 Jul	0.290	0.307	0.328	0.389	0.313	0.248	0.257	0.438	0.225	0.143	0.263	0.229	0.275	0.363	0.193
04 Jul	0.297	0.315	0.337	0.409	0.346	0.264	0.265	0.459	0.244	0.152	0.267	0.262	0.287	0.373	0.196
05 Jul	0.321	0.332	0.361	0.414	0.354	0.268	0.268	0.483	0.261	0.156	0.274	0.271	0.310	0.379	0.201
06 Jul	0.353	0.347	0.383	0.424	0.379	0.284	0.274	0.501	0.275	0.160	0.279	0.298	0.314	0.392	0.202
07 Jul	0.365	0.377	0.394	0.449	0.427	0.314	0.289	0.510	0.288	0.174	0.299	0.313	0.323	0.394	0.208
08 Jul	0.385	0.412	0.416	0.476	0.469	0.329	0.299	0.527	0.295	0.201	0.309	0.320	0.333	0.402	0.216
09 Jul	0.411	0.419	0.441	0.482	0.487	0.351	0.302	0.537	0.310	0.218	0.317	0.339	0.339	0.411	0.223
10 Jul	0.438	0.427	0.472	0.493	0.514	0.379	0.305	0.549	0.330	0.225	0.332	0.353	0.351	0.414	0.234
11 Jul	0.446	0.439	0.481	0.498	0.525	0.410	0.307	0.582	0.337	0.243	0.339	0.396	0.360	0.420	0.243
12 Jul	0.452	0.445	0.502	0.505	0.533	0.463	0.314	0.613	0.342	0.248	0.354	0.411	0.387	0.423	0.250
13 Jul	0.465	0.453	0.534	0.513	0.546	0.480	0.377	0.640	0.348	0.253	0.362	0.427	0.403	0.430	0.261
14 Jul	0.474	0.467	0.594	0.530	0.553	0.504	0.538	0.654	0.358	0.267	0.392	0.465	0.428	0.434	0.279
15 Jul	0.496	0.473	0.664	0.562	0.570	0.523	0.603	0.665	0.400	0.277	0.455	0.535	0.456	0.439	0.346
16 Jul	0.522	0.481	0.673	0.596	0.582	0.603	0.634	0.684	0.437	0.289	0.518	0.561	0.503	0.481	0.424
17 Jul	0.573	0.501	0.691	0.640	0.597	0.675	0.653	0.696	0.447	0.298	0.559	0.584	0.587	0.536	0.432
18 Jul	0.603	0.516	0.702	0.688	0.621	0.706	0.666	0.716	0.456	0.369	0.585	0.601	0.649	0.598	0.453

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Date	Cumulative Proportion														
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
19 Jul	0.642	0.534	0.730	0.706	0.642	0.722	0.676	0.731	0.469	0.425	0.648	0.636	0.678	0.620	0.473
20 Jul	0.671	0.563	0.763	0.717	0.678	0.734	0.684	0.744	0.476	0.449	0.666	0.657	0.709	0.668	0.507
21 Jul	0.687	0.619	0.777	0.729	0.687	0.757	0.711	0.755	0.484	0.520	0.689	0.667	0.736	0.684	0.585
22 Jul	0.713	0.679	0.807	0.733	0.708	0.787	0.724	0.766	0.491	0.585	0.717	0.673	0.760	0.708	0.636
23 Jul	0.740	0.721	0.843	0.746	0.723	0.820	0.741	0.785	0.498	0.623	0.735	0.680	0.780	0.754	0.653
24 Jul	0.773	0.757	0.876	0.800	0.752	0.834	0.755	0.802	0.504	0.663	0.753	0.687	0.807	0.787	0.672
25 Jul	0.799	0.792	0.895	0.901	0.791	0.852	0.769	0.817	0.518	0.728	0.783	0.704	0.816	0.819	0.743
26 Jul	0.820	0.829	0.912	0.911	0.812	0.864	0.780	0.830	0.527	0.784	0.831	0.740	0.822	0.849	0.799
27 Jul	0.839	0.865	0.931	0.927	0.823	0.882	0.788	0.837	0.537	0.819	0.871	0.776	0.834	0.873	0.848
28 Jul	0.870	0.881	0.947	0.936	0.835	0.901	0.799	0.846	0.590	0.833	0.894	0.788	0.856	0.886	0.874
29 Jul	0.893	0.900	0.965	0.950	0.852	0.917	0.807	0.861	0.676	0.848	0.906	0.808	0.866	0.898	0.893
30 Jul	0.913	0.913	0.974	0.967	0.862	0.929	0.815	0.880	0.705	0.863	0.915	0.831	0.875	0.910	0.908
31 Jul	0.938	0.925	0.983	0.980	0.873	0.939	0.822	0.889	0.739	0.881	0.927	0.845	0.889	0.919	0.922
01 Aug	0.960	0.935	0.990	0.988	0.887	0.947	0.827	0.896	0.771	0.894	0.938	0.862	0.899	0.928	0.934
02 Aug	0.968	0.948	1.000	0.993	0.908	0.956	0.833	0.902	0.806	0.903	0.947	0.878	0.920	0.936	0.943
03 Aug	0.974	0.961	–	1.000	0.925	0.963	0.843	0.911	0.829	0.910	0.957	0.895	0.927	0.943	0.951
04 Aug	0.980	0.972	–	–	0.940	0.967	0.864	0.915	0.855	0.922	0.967	0.913	0.931	0.951	0.960
05 Aug	0.988	0.979	–	–	0.949	0.973	0.877	0.923	0.870	0.931	0.974	0.930	0.941	0.960	0.968
06 Aug	0.992	0.986	–	–	0.958	0.979	0.887	0.933	0.880	0.938	0.980	0.944	0.952	0.970	0.974
07 Aug	0.997	0.993	–	–	0.969	0.985	0.897	0.936	0.886	0.949	0.984	0.953	0.959	0.974	0.980
08 Aug	1.000	1.000	–	–	0.978	0.990	0.906	0.940	0.892	0.962	0.988	0.965	0.967	0.979	0.984
09 Aug	–	–	–	–	0.987	0.994	0.923	0.943	0.901	0.974	0.994	0.975	0.972	0.986	0.988
10 Aug	–	–	–	–	0.994	1.000	0.935	0.947	0.909	0.980	1.000	0.982	0.975	0.993	0.991
11 Aug	–	–	–	–	1.000	–	0.946	0.954	0.923	0.989	–	0.987	0.979	1.000	0.994
12 Aug	–	–	–	–	–	–	0.957	0.968	0.940	0.996	–	0.994	0.984	–	0.997
13 Aug	–	–	–	–	–	–	0.970	0.980	0.956	1.000	–	1.000	0.989	–	1.000
14 Aug	–	–	–	–	–	–	0.982	0.991	0.966	–	–	–	0.994	–	–
15 Aug	–	–	–	–	–	–	0.992	1.000	0.978	–	–	–	1.000	–	–
16 Aug	–	–	–	–	–	–	–	1.000	–	0.987	–	–	–	–	–
18 Aug	–	–	–	–	–	–	–	–	–	1.000	–	–	–	–	–
Midpoint	16 Jul	17 Jul	12 Jul	12 Jul	10 Jul	14 Jul	14 Jul	6 Jul	24 Jul	21 Jul	16 Jul	15 Jul	16 Jul	17 Jul	20 Jul
Midpoint Average (1979–11):	15 Jul	(1998–11):	15 Jul												
No. days for 80%	36	34	31	35	44	35	47	46	46	37	35	41	40	40	33
80% Ave: (1979–11):	38 d	(1998–11):	40 d												

Table 16.—Daily fish wheel catch by species for the Kasilof River, 2012.

Date	Hours open	Sockeye		Pink		Coho		Chinook	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
15 Jun	0.0	ND	0	ND	0	ND	0	ND	0
16 Jun	0.0	ND	0	ND	0	ND	0	ND	0
17 Jun	0.0	ND	0	ND	0	ND	0	ND	0
18 Jun	19.1	1	1	0	0	0	0	0	0
19 Jun	23.9	5	6	0	0	0	0	0	0
20 Jun	21.5	5	11	0	0	0	0	0	0
21 Jun	23.5	14	25	0	0	0	0	0	0
22 Jun	23.6	6	31	0	0	0	0	0	0
23 Jun	22.4	15	46	0	0	0	0	0	0
24 Jun	20.8	5	51	0	0	0	0	0	0
25 Jun	24.6	5	56	0	0	0	0	0	0
26 Jun	22.0	22	78	0	0	0	0	0	0
27 Jun	22.3	55	133	0	0	0	0	0	0
28 Jun	22.2	61	194	0	0	0	0	0	0
29 Jun	26.3	44	238	0	0	0	0	0	0
30 Jun	11.6	29	267	0	0	0	0	0	0
1 Jul	8.9	29	296	0	0	0	0	0	0
2 Jul	23.9	8	304	0	0	0	0	0	0
3 Jul	18.5	9	313	0	0	0	0	0	0
4 Jul	22.3	3	316	0	0	0	0	0	0
5 Jul	24.0	2	318	0	0	0	0	0	0
6 Jul	23.7	3	321	0	0	0	0	0	0
7 Jul	22.4	17	338	0	0	0	0	0	0
8 Jul	19.9	82	420	0	0	0	0	1	1
9 Jul	11.7	52	472	0	0	0	0	0	1
10 Jul	8.6	56	528	0	0	0	0	0	1
11 Jul	8.0	24	552	0	0	0	0	0	1
12 Jul	23.0	22	574	0	0	0	0	0	1
13 Jul	5.0	44	618	0	0	0	0	0	1
14 Jul	7.5	56	674	0	0	0	0	0	1
15 Jul	0.7	87	761	0	0	0	0	0	1
16 Jul	5.7	139	900	0	0	0	0	0	1
17 Jul	8.0	10	910	0	0	0	0	0	1
18 Jul	5.5	47	957	0	0	0	0	0	1
19 Jul	6.0	37	994	0	0	0	0	0	1
20 Jul	3.0	125	1,119	0	0	0	0	0	1
21 Jul	1.0	78	1,197	0	0	0	0	0	1
22 Jul	10.6	59	1,256	0	0	0	0	0	1
23 Jul	8.0	43	1,299	0	0	0	0	0	1
24 Jul	4.9	81	1,380	0	0	0	0	0	1
25 Jul	1.0	168	1,548	0	0	0	0	0	1
26 Jul	0.5	54	1,602	0	0	0	0	0	1
27 Jul	1.0	90	1,692	0	0	0	0	0	1
28 Jul	1.0	130	1,822	0	0	0	0	0	1
29 Jul	4.7	25	1,847	0	0	0	0	0	1
30 Jul	3.0	25	1,872	0	0	0	0	0	1
31 Jul	6.5	43	1,915	0	0	0	0	0	1

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Table 16.—Page 2 of 2.

Date	Hours open	Sockeye		Pink		Coho		Chinook	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
1 Aug	5.8	13	1,928	0	0	0	0	0	1
2 Aug	9.5	5	1,933	0	0	0	0	1	2
3 Aug	23.3	4	1,937	0	0	0	0	0	2
4 Aug	24.2	6	1,943	0	0	0	0	0	2
5 Aug	19.5	40	1,983	0	0	0	0	0	2
6 Aug	16.8	16	1,999	2	2	0	0	0	2
7 Aug	7.6	21	2,020	1	3	0	0	0	2
8 Aug	14.2	23	2,043	2	5	0	0	1	3
9 Aug	18.2	19	2,062	1	6	0	0	2	5
10 Aug	23.7	13	2,075	1	7	0	0	0	5
11 Aug	0.0	ND	2,075	ND	7	ND	0	ND	5
12 Aug	0.0	ND	2,075	ND	7	ND	0	ND	5
13 Aug	0.0	ND	2,075	ND	7	ND	0	ND	5
Percent:		99.4%		0.3%		0.0%		0.2%	
Total catch:	2,087	salmon		Hrs Operated:	744.9	CPUE (fish/hr):	2.8		
Efficiency: 8.7% of total north bank count (fish wheel catch adjusted to 24 hrs).									

Note: Fish wheel not operated 15–17 June because of low water. Fish wheel operations ended on 10 August.

Table 17.—Summary of north bank Kasilof River fish wheel catches and CPUE, 1983–2012.

Year	Total	Actual North Bank fish wheel catch (salmon only)							Total	CPUE by species				Total CPUE	
	Hours	Sockeye	%	Pink	%	Coho	%	Chinook	%	Catch	Sockeye	Pink	Coho	Chinook	
1983	582.5	2,094	96.8	26	1.2	2	0.1	41	1.9	2,163	3.6	0.0	0.0	0.1	3.7
1984	809.5	3,907	97.7	44	1.1	8	0.2	41	1.0	4,000	4.8	0.1	0.0	0.1	4.9
1985	747.0	4,996	98.3	49	1.0	4	0.1	32	0.6	5,081	6.7	0.1	0.0	0.0	6.8
1986	613.0	7,186	97.4	77	1.0	6	0.1	108	1.5	7,377	11.7	0.1	0.0	0.2	12.0
1987	768.4	3,910	96.2	20	0.5	0	0.0	136	3.3	4,066	5.1	0.0	0.0	0.2	5.3
1988	720.0	4,662	96.7	37	0.8	3	0.1	119	2.5	4,821	6.5	0.1	0.0	0.2	6.7
1989	959.1	4,017	94.0	154	3.6	5	0.1	99	2.3	4,275	4.2	0.2	0.0	0.1	4.5
1990	1,073.8	1,750	93.4	26	1.4	0	0.0	98	5.2	1,874	1.6	0.0	0.0	0.1	1.7
1991	557.7	1,889	95.9	65	3.3	1	0.1	14	0.7	1,969	3.4	0.1	0.0	0.0	3.5
1992	778.8	2,380	95.0	40	1.6	2	0.1	82	3.3	2,504	3.1	0.1	0.0	0.1	3.2
1993	840.0	2,100	93.9	52	2.3	0	0.0	85	3.8	2,237	2.5	0.1	0.0	0.1	2.7
1994	609.3	3,514	97.3	37	1.0	3	0.1	59	1.6	3,613	5.8	0.1	0.0	0.1	5.9
1995	678.2	2,023	96.4	28	1.3	1	0.0	46	2.2	2,098	3.0	0.0	0.0	0.1	3.1
1996	505.8	3,009	98.9	5	0.2	2	0.1	28	0.9	3,044	5.9	0.0	0.0	0.1	6.0
1997	505.0	2,076	97.0	16	0.7	3	0.1	46	2.1	2,141	4.1	0.0	0.0	0.1	4.2
1998	462.9	1,937	96.6	18	0.9	4	0.2	47	2.3	2,006	4.2	0.0	0.0	0.1	4.3
1999	503.0	1,952	92.1	108	5.1	2	0.1	58	2.7	2,120	3.9	0.2	0.0	0.1	4.2
2000	670.5	1,792	94.2	37	1.9	16	0.8	57	3.0	1,902	2.7	0.1	0.0	0.1	2.8
2001	391.4	1,765	96.4	23	1.3	1	0.1	42	2.3	1,831	4.5	0.1	0.0	0.1	4.7
2002	843.4	2,449	96.9	29	1.1	13	0.5	37	1.5	2,528	2.9	0.0	0.0	0.0	3.0
2003	822.2	1,704	98.3	15	0.9	0	0.0	14	0.8	1,733	2.1	0.0	0.0	0.0	2.1
2004	953.6	1,991	95.7	48	2.3	2	0.1	39	1.9	2,080	2.1	0.1	0.0	0.0	2.2
2005	785.1	1,812	95.5	66	3.5	0	0.0	19	1.0	1,897	2.3	0.1	0.0	0.0	2.4
2006	739.5	1,630	94.4	39	2.3	24	1.4	34	2.0	1,727	2.2	0.1	0.0	0.0	2.3
2007	877.3	1,580	97.8	15	0.9	4	0.2	17	1.1	1,616	1.8	0.0	0.0	0.0	1.8
2008	448.1	1,931	99.4	9	0.5	1	0.1	2	0.1	1,943	4.3	0.0	0.0	0.0	4.3
2009	514.2	1,390	96.8	42	2.9	0	0.0	4	0.3	1,436	2.7	0.1	0.0	0.0	2.8
2010	863.5	1,533	97.4	18	1.1	3	0.2	20	1.3	1,574	1.8	0.0	0.0	0.0	1.8
2011	601.2	1,395	98.7	12	0.8	1	0.1	5	0.4	1,413	2.3	0.0	0.0	0.0	2.4
2012	744.9	2,075	99.4	7	0.3	0	0.0	5	0.2	2,087	2.8	0.0	0.0	0.0	2.8
	Ave :	96.5	1.5	0.1		1.9				3.7	0.1	0.0	0.1	3.8	
	min :	92.1	0.2	0.0		0.1				1.6	0.0	0.0	0.0	1.7	
	max :	99.4	5.1	1.4		5.2				11.7	0.2	0.0	0.2	12.0	
	SD :	1.8	1.1	0.3		1.2				2.1	0.0	0.0	0.0	2.1	

Table 18.—Age composition of sockeye salmon sampled from the Kasilof River fish wheel catch, 1969–2012.

Year	% Composition by Age Class								<i>n</i>
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	Other	
1969	0.0	14.0	39.0	1.0	0.0	30.0	16.0	0.0	399
1970	0.0	2.0	37.0	2.0	0.0	16.0	11.0	2.0	297
1971	0.0	6.0	69.0	0.0	0.0	8.0	16.0	1.0	153
1972	0.0	42.0	36.0	1.0	0.0	3.0	18.0	0.0	668
1973	0.0	20.0	57.0	0.0	0.0	19.0	4.0	0.0	374
1974	0.0	35.0	59.0	0.0	0.0	4.0	2.0	0.0	254
1975	1.0	29.0	7.0	0.0	0.0	58.0	4.0	1.0	931
1976	0.2	35.9	24.1	0.0	0.0	28.2	11.4	0.2	755
1977	0.3	29.4	30.0	0.0	0.8	27.8	11.7	0.0	1,209
1978	0.0	41.3	40.1	0.0	0.0	10.4	8.2	0.0	967
1979	0.7	58.9	28.2	0.0	0.0	10.5	1.6	0.1	590
1980	2.1	67.0	23.1	0.1	0.0	5.0	2.7	0.0	899
1981	0.0	28.9	63.6	0.0	0.0	5.9	1.6	0.0	1,479
1982	0.8	30.6	54.4	0.0	0.2	9.3	4.7	0.0	1,518
1983	0.0	49.5	33.1	0.0	0.0	12.9	4.5	0.0	1,997
1984	0.0	50.5	24.8	0.0	0.2	17.9	6.6	0.0	2,269
1985	0.2	57.3	21.8	0.1	0.1	17.8	2.6	0.1	3,063
1986	0.0	40.9	42.0	0.3	0.1	11.9	4.6	0.2	1,660
1987	0.2	43.4	27.4	0.0	0.1	22.4	6.4	0.0	1,248
1988	0.1	33.7	36.4	0.2	0.1	17.6	12.0	0.0	2,282
1989	0.0	14.9	35.3	0.1	0.1	36.6	13.0	0.0	1,301
1990	0.4	32.9	20.7	0.3	0.0	33.2	12.4	0.3	762
1991	0.0	31.5	33.4	0.1	0.1	29.0	5.8	0.1	2,106
1992	0.0	21.1	27.5	0.0	0.2	35.3	16.0	0.0	1,717
1993	0.4	16.3	29.8	0.0	0.4	28.0	25.2	0.0	571
1994	0.0	26.4	28.4	0.0	0.0	28.2	17.0	0.0	723
1995	0.2	44.0	15.5	0.0	0.0	25.0	15.3	0.0	587
1996	0.0	24.8	48.3	0.0	0.0	21.4	5.6	0.0	721
1997	0.0	21.1	54.8	0.0	0.0	13.5	10.7	0.0	758
1998	0.1	39.7	28.1	0.4	0.6	22.2	8.9	0.0	857
1999	0.0	29.7	33.8	0.2	0.1	26.7	9.4	0.1	964
2000	0.1	41.9	33.9	0.0	0.4	11.4	12.3	0.0	747
2001	0.4	29.3	48.6	0.2	0.2	16.5	4.8	0.2	564
2002	0.3	33.9	38.1	0.3	1.5	19.3	6.6	0.1	746
2003	0.7	37.3	26.1	0.0	0.2	29.3	6.5	0.0	1,298
2004	0.1	43.7	18.9	0.1	0.2	32.6	4.3	0.1	908
2005	0.7	38.8	32.8	0.0	0.3	18.7	8.8	0.0	1,278
2006	0.5	35.3	30.5	0.0	0.4	27.4	5.8	0.1	737
2007	0.7	44.8	25.3	0.0	0.2	19.3	9.9	0.0	628
2008	0.4	39.5	38.3	0.0	0.2	17.9	3.7	0.0	448
2009	0.0	8.5	60.4	0.3	0.0	17.2	13.6	0.0	331
2010	1.1	27.7	31.2	0.0	1.5	31.2	7.1	0.2	477
2011	1.4	13.7	31.5	0.0	2.7	25.2	25.6	0.0	489
2012	6.8	34.0	10.6	0.0	4.4	37.6	6.6	0.0	473
Ave (1969–11)	0.3	33.3	35.5	0.2	0.2	20.8	8.9	0.1	1,006

Table 19.—Average lengths of the major age classes of sockeye salmon sampled from the Kaslof River fish wheel, 1980–2012.

Year	Age Class	Male		Female		Total		Ratio Male: Female	Age Class	Male		Female		Total		Ratio Male: Female
		Length (mm)	n	Length (mm)	n	Length (mm)	n			Length (mm)	n	Length (mm)	n	Length (mm)	n	
1980	1.2	474	189	464	376	467	565	0.5:1	1.3	531	35	516	115	520	150	0.3:1
1981		503	241	492	146	499	387	1.7:1		566	422	558	369	562	791	1.1:1
1982		481	285	466	235	474	520	1.2:1		549	377	542	428	545	805	0.9:1
1983		493	113	491	78	492	191	1.4:1		558	170	547	187	552	357	0.9:1
1984		480	544	478	428	479	972	2.6:1		539	304	533	383	535	687	0.8:1
1985		474	723	472	897	473	1620	0.8:1		531	341	527	433	529	774	0.8:1
1986		482	266	482	368	482	634	0.7:1		550	342	543	405	546	747	0.8:1
1987		472	282	470	257	471	539	1.1:1		553	191	551	154	552	345	1.2:1
1988		480	353	477	480	478	833	0.7:1		550	311	543	382	546	693	0.8:1
1989		476	77	476	107	476	184	0.8:1		552	233	544	253	547	486	0.9:1
1990		462	139	458	91	460	230	1.5:1		518	81	523	106	521	187	0.8:1
1991		467	326	461	305	464	631	1.1:1		531	418	518	335	525	753	1.3:1
1992		468	184	465	212	467	396	0.9:1		535	195	527	197	531	392	1.0:1
1993		479	40	479	53	479	93	0.8:1		550	101	542	69	547	170	1.5:1
1994		465	96	466	95	465	191	1.0:1		539	102	530	103	535	205	1.0:1
1995		491	117	483	141	487	258	0.8:1		542	42	534	49	538	91	0.9:1
1996		476	96	475	83	475	179	1.2:1		565	214	557	134	562	348	1.6:1
1997		456	80	452	80	454	160	1.0:1		555	223	541	192	548	415	1.2:1
1998		475	178	468	162	472	340	1.1:1		527	110	525	131	526	241	0.8:1
1999		479	140	474	146	476	286	1.0:1		543	167	542	159	542	326	1.1:1
2000		481	162	474	162	478	324	1.0:1		555	140	547	122	551	262	1.2:1
2001		479	77	477	88	478	165	0.9:1		549	149	545	125	547	274	1.2:1
2002		486	114	476	139	480	253	0.8:1		555	144	544	140	549	284	1.1:1
2003		481	230	480	247	481	477	0.9:1		546	167	546	207	546	374	0.8:1
2004		482	181	475	216	478	397	0.8:1		549	82	539	90	544	172	0.9:1
2005		470	260	468	350	469	610	0.7:1		544	142	543	149	543	291	1:1
2006		464	112	458	148	461	260	0.8:1		519	111	513	114	516	225	1.0:1
2007		468	127	464	154	466	281	0.8:1		545	77	538	82	542	159	0.9:1
2008		456	100	454	103	455	203	1.0:1		539	67	533	61	536	128	1.1:1
2009		483	15	485	13	484	28	1.2:1		547	96	542	104	545	200	0.9:1
2010		471	54	466	78	468	132	0.7:1		538	64	532	85	534	149	0.8:1
2011		461	35	465	32	463	67	1.1:1		551	59	549	95	549	154	0.6:1
2012		530	83	466	78	499	161	1.1:1		548	16	530	34	536	50	0.5:1
Ave. (1980–2011)		475	186	472	202	473	388	0.9:1		544	177	538	186	541	364	1.0:1

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Table 19.—Page 2 of 2.

Table 20.—Minimum and maximum (DIDSON) salmon escapement estimates into the Yentna River drainage, 7 July–15 August, 2012.

Date	Sockeye				Pink			
	Daily		Cum		Daily		Cum	
	Min	Max	Min	Max	Min	Max	Min	Max
7 Jul	36	125	36	125	8	45	8	45
8 Jul	132	132	168	257	0	0	8	45
9 Jul	0	0	168	257	31	31	39	76
10 Jul	48	87	216	344	9	48	48	124
11 Jul	40	95	255	439	17	54	65	178
12 Jul	97	157	352	596	2	20	67	198
13 Jul	130	355	482	950	55	269	123	467
14 Jul	54	149	537	1,100	0	0	123	467
15 Jul	100	348	637	1,448	47	330	169	796
16 Jul	207	451	844	1,898	36	266	205	1,062
17 Jul	2,334	3,734	3,179	5,632	66	541	271	1,603
18 Jul	5,917	7,918	9,096	13,551	96	812	367	2,415
19 Jul	1,069	2,457	10,165	16,008	258	1,553	625	3,968
20 Jul	726	2,044	10,891	18,052	1,324	4,547	1,949	8,515
21 Jul	920	2,572	11,811	20,624	1,217	4,610	3,166	13,125
22 Jul	2,431	6,700	14,242	27,324	2,927	9,871	6,093	22,996
23 Jul	3,449	11,747	17,691	39,071	7,352	19,937	13,445	42,933
24 Jul	2,824	9,590	20,514	48,662	6,365	17,355	19,810	60,288
25 Jul	1,417	5,720	21,931	54,382	7,135	16,518	26,945	76,806
26 Jul	1,883	8,161	23,814	62,543	16,670	36,238	43,616	113,044
27 Jul	1,447	7,415	25,261	69,957	31,366	57,860	74,982	170,904
28 Jul	850	4,082	26,111	74,039	26,793	52,874	101,775	223,778
29 Jul	461	2,010	26,572	76,049	21,547	47,005	123,322	270,783
30 Jul	306	1,242	26,878	77,291	10,797	24,900	134,119	295,684
31 Jul	313	1,162	27,191	78,453	7,808	20,050	141,927	315,734
1 Aug	313	1,106	27,504	79,560	3,879	12,113	145,806	327,847
2 Aug	264	948	27,768	80,508	5,712	16,161	151,518	344,008
3 Aug	442	1,785	28,209	82,293	4,205	9,564	155,723	353,572
4 Aug	430	1,440	28,639	83,732	2,335	7,962	158,058	361,534
5 Aug	480	1,668	29,119	85,400	4,182	11,391	162,240	372,924
6 Aug	515	1,722	29,634	87,122	2,361	9,394	164,601	382,318
7 Aug	241	834	29,875	87,956	1,781	7,291	166,382	389,609
8 Aug	96	333	29,972	88,289	767	3,203	167,149	392,811
9 Aug	154	494	30,126	88,783	393	1,699	167,543	394,511
10 Aug	58	191	30,183	88,974	259	1,084	167,801	395,595
11 Aug	76	247	30,259	89,221	123	726	167,924	396,321
12 Aug	49	168	30,308	89,389	95	559	168,019	396,880
13 Aug	52	185	30,360	89,573	41	282	168,060	397,162
14 Aug	58	214	30,418	89,787	26	180	168,085	397,343
15 Aug	44	171	30,462	89,957	12	102	168,097	397,444

% Total of min & max escapement: 12.1%

11.7%

66.7% 51.5%

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Table 20.—Page 2 of 2.

Date	Chum				Coho			
	Daily		Cum		Daily		Cum	
	Min	Max	Min	Max	Min	Max	Min	Max
7 Jul	0	0	0	0	54	169	54	169
8 Jul	0	0	0	0	0	0	54	169
9 Jul	48	48	48	48	0	0	54	169
10 Jul	0	0	48	48	72	72	126	241
11 Jul	20	43	68	91	0	0	126	241
12 Jul	22	57	90	148	10	62	136	303
13 Jul	284	520	373	668	31	235	168	538
14 Jul	118	393	492	1,061	211	563	379	1,101
15 Jul	156	481	648	1,542	325	1,012	703	2,113
16 Jul	82	276	730	1,819	174	627	878	2,741
17 Jul	250	999	981	2,818	273	1,894	1,150	4,635
18 Jul	335	1,442	1,315	4,260	253	2,155	1,403	6,790
19 Jul	479	1,438	1,794	5,698	584	2,937	1,988	9,727
20 Jul	1,093	2,731	2,887	8,430	597	3,536	2,585	13,263
21 Jul	1,423	3,150	4,310	11,579	455	2,965	3,040	16,228
22 Jul	617	1,797	4,927	13,377	738	5,250	3,778	21,478
23 Jul	642	1,988	5,569	15,365	836	7,335	4,614	28,814
24 Jul	398	1,244	5,967	16,608	911	7,391	5,526	36,205
25 Jul	434	1,372	6,401	17,981	905	7,128	6,431	43,333
26 Jul	811	2,588	7,212	20,568	2,078	16,954	8,508	60,287
27 Jul	428	1,428	7,640	21,996	2,808	24,443	11,317	84,729
28 Jul	511	1,686	8,151	23,682	3,414	26,738	14,731	111,468
29 Jul	488	1,587	8,639	25,269	4,049	28,196	18,780	139,663
30 Jul	306	982	8,945	26,252	2,409	15,803	21,189	155,466
31 Jul	252	800	9,197	27,051	2,369	14,146	23,558	169,612
1 Aug	221	676	9,417	27,727	2,040	10,207	25,598	179,819
2 Aug	579	1,732	9,996	29,459	2,288	12,503	27,885	192,322
3 Aug	490	1,482	10,486	30,941	655	4,810	28,540	197,132
4 Aug	303	889	10,789	31,829	1,390	6,957	29,930	204,089
5 Aug	368	1,123	11,157	32,952	1,308	7,959	31,238	212,047
6 Aug	963	2,553	12,120	35,505	2,142	9,516	33,381	221,564
7 Aug	931	2,476	13,052	37,982	1,967	8,042	35,348	229,605
8 Aug	581	1,427	13,632	39,409	834	3,505	36,182	233,111
9 Aug	345	875	13,977	40,283	487	2,088	36,668	235,199
10 Aug	356	751	14,333	41,035	248	1,169	36,916	236,368
11 Aug	205	594	14,539	41,629	402	1,345	37,318	237,713
12 Aug	195	577	14,734	42,206	394	1,221	37,712	238,935
13 Aug	90	279	14,824	42,485	223	687	37,934	239,622
14 Aug	101	331	14,925	42,816	237	706	38,172	240,328
15 Aug	100	327	15,025	43,143	231	631	38,403	240,959
% Total of min & max:		6.0%	5.6%			15.2%	31.2%	

Note: Various fish wheel coefficients were factored into the daily (apportioned) sonar estimates to determine the minimum and maximum escapement range.

Table 21.—Cumulative proportion by date of sockeye salmon escapement recorded in the Yentna River, 1995–2012.

Date	Cumulative Proportion ^a																	
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
07 Jul	0.001	0.001	0.004	0.003	0.000	0.007	0.005	0.029	0.004	0.002	0.007	0.004	0.000	0.001	0.001	0.001	0.001	0.001
08 Jul	0.001	0.003	0.006	0.006	0.001	0.013	0.010	0.101	0.007	0.004	0.017	0.006	0.001	0.002	0.003	0.002	0.004	0.004
09 Jul	0.002	0.005	0.009	0.010	0.002	0.020	0.015	0.155	0.010	0.006	0.021	0.009	0.001	0.004	0.004	0.004	0.006	0.004
10 Jul	0.003	0.007	0.011	0.017	0.005	0.024	0.023	0.187	0.014	0.007	0.028	0.013	0.002	0.006	0.008	0.005	0.009	0.005
11 Jul	0.004	0.007	0.013	0.030	0.010	0.033	0.029	0.207	0.018	0.008	0.035	0.018	0.002	0.007	0.013	0.007	0.012	0.006
12 Jul	0.005	0.009	0.016	0.043	0.017	0.046	0.041	0.226	0.023	0.010	0.041	0.022	0.002	0.010	0.024	0.009	0.014	0.008
13 Jul	0.006	0.011	0.030	0.051	0.024	0.075	0.050	0.236	0.051	0.011	0.057	0.024	0.004	0.013	0.045	0.016	0.015	0.012
14 Jul	0.006	0.013	0.087	0.056	0.031	0.124	0.058	0.251	0.126	0.014	0.081	0.026	0.004	0.017	0.074	0.034	0.019	0.014
15 Jul	0.007	0.022	0.149	0.059	0.044	0.263	0.068	0.271	0.192	0.092	0.109	0.027	0.005	0.068	0.113	0.063	0.023	0.017
16 Jul	0.007	0.131	0.197	0.064	0.057	0.407	0.098	0.328	0.239	0.263	0.131	0.031	0.006	0.148	0.189	0.098	0.028	0.023
17 Jul	0.012	0.348	0.229	0.072	0.068	0.490	0.184	0.446	0.261	0.377	0.147	0.042	0.009	0.228	0.281	0.163	0.034	0.073
18 Jul	0.022	0.519	0.254	0.094	0.081	0.600	0.270	0.535	0.316	0.457	0.165	0.087	0.013	0.299	0.336	0.223	0.145	0.188
19 Jul	0.068	0.614	0.280	0.159	0.108	0.730	0.359	0.570	0.372	0.519	0.205	0.160	0.015	0.387	0.377	0.266	0.386	0.217
20 Jul	0.160	0.671	0.316	0.239	0.160	0.849	0.414	0.628	0.489	0.555	0.242	0.217	0.040	0.538	0.416	0.332	0.512	0.240
21 Jul	0.251	0.702	0.367	0.304	0.222	0.910	0.423	0.684	0.611	0.573	0.273	0.239	0.091	0.636	0.459	0.399	0.610	0.269
22 Jul	0.335	0.745	0.434	0.327	0.319	0.950	0.429	0.734	0.678	0.593	0.303	0.257	0.160	0.700	0.497	0.474	0.689	0.345
23 Jul	0.378	0.784	0.492	0.338	0.433	0.969	0.480	0.754	0.706	0.619	0.326	0.285	0.251	0.779	0.531	0.529	0.719	0.471
24 Jul	0.426	0.822	0.544	0.357	0.510	0.978	0.563	0.783	0.747	0.657	0.365	0.307	0.320	0.821	0.567	0.573	0.735	0.574
25 Jul	0.496	0.856	0.606	0.378	0.567	0.984	0.630	0.807	0.783	0.681	0.430	0.325	0.374	0.851	0.591	0.609	0.765	0.634
26 Jul	0.580	0.880	0.668	0.403	0.605	0.989	0.704	0.820	0.813	0.711	0.485	0.353	0.417	0.862	0.609	0.649	0.799	0.717
27 Jul	0.678	0.899	0.697	0.426	0.653	0.994	0.803	0.835	0.844	0.722	0.516	0.390	0.450	0.868	0.623	0.686	0.817	0.791
28 Jul	0.743	0.913	0.722	0.454	0.702	0.996	0.880	0.855	0.865	0.729	0.532	0.459	0.514	0.878	0.646	0.736	0.843	0.832
29 Jul	0.796	0.928	0.743	0.493	0.767	0.996	0.921	0.871	0.881	0.739	0.555	0.564	0.564	0.890	0.684	0.768	0.879	0.852
30 Jul	0.832	0.941	0.767	0.560	0.804	0.997	0.944	0.891	0.892	0.756	0.581	0.630	0.589	0.897	0.734	0.792	0.901	0.865
31 Jul	0.852	0.943	0.795	0.622	0.848	0.999	0.954	0.906	0.909	0.781	0.628	0.698	0.603	0.907	0.756	0.820	0.915	0.877
01 Aug	0.875	0.948	0.826	0.684	0.878	1.000	0.970	0.918	0.941	0.792	0.677	0.733	0.619	0.914	0.787	0.851	0.924	0.889
02 Aug	0.897	0.954	0.852	0.762	0.895	—	0.985	0.931	0.963	0.809	0.718	0.769	0.647	0.924	0.838	0.870	0.932	0.899
03 Aug	0.915	0.965	0.870	0.830	0.914	—	0.991	0.947	0.977	0.826	0.766	0.825	0.687	0.939	0.881	0.889	0.937	0.918
04 Aug	0.928	0.981	0.893	0.876	0.934	—	0.994	0.964	0.983	0.851	0.792	0.867	0.725	0.959	0.915	0.918	0.938	0.933
05 Aug	0.944	0.991	0.911	0.907	0.947	—	1.000	0.979	0.990	0.882	0.810	0.897	0.743	0.973	0.932	0.932	0.939	0.951
06 Aug	0.975	0.996	0.923	0.927	0.955	—	—	0.990	1.000	0.910	0.844	0.919	0.758	0.981	0.947	0.941	0.943	0.970
07 Aug	0.990	1.000	0.931	0.938	0.963	—	—	0.996	—	0.934	0.895	0.948	0.790	0.986	0.962	0.950	0.955	0.979
08 Aug	0.992	—	0.945	0.947	0.971	—	—	1.000	—	0.953	0.917	0.970	0.826	0.989	0.977	0.958	0.965	0.982
09 Aug	0.996	—	0.961	0.953	0.978	—	—	—	—	0.968	0.948	0.982	0.871	0.994	0.986	0.968	0.975	0.987

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Table 21–Page 2 of 2.

	Cumulative Proportion ^a																	
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
10 Aug	1.000	—	0.982	0.959	0.988	—	—	—	—	0.981	0.968	0.989	0.898	1.000	0.992	0.975	0.982	0.990
11 Aug	—	—	0.992	0.966	0.994	—	—	—	—	0.993	0.979	0.994	0.933	—	0.995	0.982	0.989	0.992
12 Aug	—	—	1.000	0.973	0.997	—	—	—	—	1.000	0.992	1.000	0.975	—	1.000	0.987	0.994	0.994
13 Aug	—	—	—	0.979	0.999	—	—	—	—	—	1.000	—	0.991	—	—	0.993	0.996	0.996
14 Aug	—	—	—	0.984	1.000	—	—	—	—	—	—	—	0.994	—	—	0.998	0.999	0.998
15 Aug	—	—	—	0.986	—	—	—	—	—	—	—	—	0.997	—	—	1.000	1.000	1.000
16 Aug	—	—	—	0.988	—	—	—	—	—	—	—	—	1.000	—	—	—	—	—
17 Aug	—	—	—	0.991	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18 Aug	—	—	—	0.993	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19 Aug	—	—	—	0.996	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20 Aug	—	—	—	0.998	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21 Aug	—	—	—	1.000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mid run:	26 Jul	18 Jul	24 Jul	30 Jul	24 Jul	18 Jul	24 Jul	18 Jul	21 Jul	19 Jul	27 Jul	29 Jul	28 Jul	20 Jul	23 Jul	23 Jul	20 Jul	24 Jul
Ave. mid run (1981–11):	24 Jul				(1995–11):	22 Jul												
No. days:																		
for 80%:	15	13	22	18	16	8	13	24	18	22	25	19	22	16	21	19	13	17
80% Ave: (1981–11):	19 d				(1995–2011):	20 d												

Note: Data available dating back to 1981.

^a Proportion averaged from minimum and maximum daily migration estimates for 2010–2012.

Table 22.—Daily fish wheel catch by species for the north bank of the Yentna River, 2012.

Date	Hours open	Sockeye		Pink		Chum		Coho		Chinook	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
7 Jul	16.9	1	1	0	0	0	0	1	1	1	1
8 Jul	17.2	1	2	0	0	0	0	0	1	4	5
9 Jul	17.3	0	2	1	1	0	0	0	1	4	9
10 Jul	16.1	1	3	1	2	0	0	0	1	0	9
11 Jul	16.8	1	4	3	5	0	0	0	1	0	9
12 Jul	17.3	3	7	0	5	2	2	0	1	4	13
13 Jul	17.4	3	10	6	11	3	5	1	2	1	14
14 Jul	17.3	0	10	0	11	1	6	2	4	3	17
15 Jul	17.8	3	13	2	13	2	8	7	11	0	17
16 Jul	17.5	11	24	6	19	4	12	3	14	0	17
17 Jul	16.8	65	89	17	36	13	25	11	25	1	18
18 Jul	17.5	203	292	15	51	15	40	15	40	3	21
19 Jul	17.5	48	340	20	71	11	51	25	65	0	21
20 Jul	17.3	18	358	38	109	13	64	16	81	1	22
21 Jul	16.0	25	383	98	207	17	81	26	107	0	22
22 Jul	15.4	54	437	149	356	12	93	48	155	0	22
23 Jul	17.1	84	521	290	646	6	99	36	191	1	23
24 Jul	17.5	101	622	392	1,038	13	112	73	264	0	23
25 Jul	17.3	48	670	428	1,466	9	121	75	339	0	23
26 Jul	17.2	29	699	1,044	2,510	11	132	78	417	1	24
27 Jul	17.7	23	722	2,088	4,598	9	141	136	553	2	26
28 Jul	17.3	17	739	2,280	6,878	16	157	193	746	0	26
29 Jul	17.4	19	758	1,922	8,800	16	173	196	942	1	27
30 Jul	17.3	11	769	1,645	10,445	11	184	164	1,106	2	29
31 Jul	16.9	17	786	1,148	11,593	11	195	171	1,277	0	29
1 Aug	16.4	15	801	705	12,298	6	201	178	1,455	0	29
2 Aug	14.9	9	810	777	13,075	12	213	108	1,563	0	29
3 Aug	16.7	29	839	465	13,540	21	234	66	1,629	0	29
4 Aug	16.6	23	862	338	13,878	17	251	81	1,710	1	30
5 Aug	16.9	18	880	396	14,274	18	269	78	1,788	1	31
6 Aug	16.9	22	902	326	14,600	24	293	94	1,882	0	31
7 Aug	17.3	9	911	277	14,877	19	312	77	1,959	0	31
8 Aug	17.3	6	917	163	15,040	24	336	54	2,013	0	31
9 Aug	16.9	5	922	66	15,106	3	339	16	2,029	0	31
10 Aug	16.8	2	924	46	15,152	7	346	14	2,043	0	31
11 Aug	17.2	9	933	51	15,203	8	354	28	2,071	0	31
12 Aug	17.2	2	935	45	15,248	9	363	30	2,101	1	32
13 Aug	17.5	4	939	15	15,263	2	365	13	2,114	0	32
14 Aug	17.4	5	944	14	15,277	3	368	12	2,126	0	32
15 Aug	15.6	3	947	10	15,287	2	370	18	2,144	1	33
16 Aug	15.8	3	950	8	15,295	1	371	9	2,153	1	34
17 Aug	15.3	0	950	3	15,298	1	372	3	2,156	0	34
18 Aug	15.8	3	953	6	15,304	1	373	4	2,160	0	34
19 Aug	14.9	3	956	3	15,307	4	377	2	2,162	0	34
20 Aug	15.1	0	956	5	15,312	2	379	5	2,167	0	34

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Table 22.–Page 2 of 2.

Date	Hours open	Sockeye			Pink			Chum		Coho		Chinook	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
21 Aug	14.4	2	958	0	15,312	1	380	3	2,170	0	34		
22 Aug	15.1	0	958	1	15,313	1	381	2	2,172	0	34		
23 Aug	15.2	1	959	1	15,314	1	382	2	2,174	0	34		
24 Aug	15.7	3	962	1	15,315	3	385	6	2,180	0	34		
25 Aug	15.8	2	964	1	15,316	0	385	5	2,185	0	34		
26 Aug	14.9	1	965	0	15,316	0	385	0	2,185	0	34		
27 Aug	15.5	0	965	2	15,318	0	385	5	2,190	0	34		
28 Aug	15.5	0	965	1	15,319	1	386	0	2,190	0	34		
29 Aug	13.7	0	965	0	15,319	0	386	0	2,190	0	34		
30 Aug	12.2	0	965	0	15,319	1	387	1	2,191	0	34		
Percent:		5.1			81.1			2.0		11.6		0.2	
Total catch:	18,896	salmon			Hrs Operated:	904.5	CPUE (fish/hr):	20.9					
Trap efficiency (7 Jul–15 Aug): ~23.5% of total north bank sonar estimate (catch adjusted through 24 hours).													
<i>Note:</i> Other species included white fish, longnose suckers , rainbow trout and Dolly Varden.													

Table 23.—Summary of fish wheel catch and CPUE by species for the north bank of the Yentna River, 1982–2012.

	Total Hours	Actual fish wheel catch - North bank								Total Catch	CPUE by species					Total CPUE		
		Sockeye	%	Pink	%	Chum	%	Coho	%	Chinook	%	Sockeye	Pink	Chum	Coho	Chinook		
	1,467.5	904	9.1	7,568	76.3	893	9.0	528	5.3	25	0.3	9,918	0.6	5.2	0.2	0.4	0.0	6.8
1982	1,564.5	933	22.0	2,667	62.8	384	9.0	213	5.0	50	1.2	4,247	0.6	1.7	0.5	0.1	0.0	2.7
1983	828.0	514	6.3	7,141	87.1	448	5.5	88	1.1	9	0.1	8,200	0.6	8.6	0.7	0.1	0.0	9.9
1984	702.5	1,099	17.5	4,415	70.4	502	8.0	241	3.8	14	0.2	6,271	1.6	6.3	0.6	0.3	0.0	8.9
1985	573.2	219	4.9	3,571	80.6	362	8.2	194	4.4	83	1.9	4,429	0.4	6.2	0.9	0.3	0.1	7.7
1986	936.4	1,393	25.5	2,983	54.5	876	16.0	172	3.1	47	0.9	5,471	1.5	3.2	2.8	0.2	0.1	5.8
1987	517.2	981	16.6	3,320	56.2	1,433	24.2	137	2.3	39	0.7	5,910	1.9	6.4	4.6	0.3	0.1	11.4
1988	790.2	2,016	13.8	8,099	55.3	3,669	25.1	803	5.5	46	0.3	14,633	2.6	10.2	2.3	1.0	0.1	18.5
1989	517.6	867	11.5	5,246	69.5	1,165	15.4	248	3.3	27	0.4	7,553	1.7	10.1	1.8	0.5	0.1	14.6
1990	530.1	768	16.2	2,071	43.8	946	20.0	932	19.7	15	0.3	4,732	1.4	3.9	2.3	1.8	0.0	8.9
1991	582.6	693	8.2	5,867	69.7	1,345	16.0	499	5.9	13	0.2	8,417	1.2	10.1	1.4	0.9	0.0	14.4
1992	399.1	931	13.9	4,789	71.3	549	8.2	432	6.4	17	0.3	6,718	2.3	12.0	1.5	1.1	0.0	16.8
1993	492.1	1,374	28.6	2,309	48.0	734	15.3	379	7.9	10	0.2	4,806	2.8	4.7	1.6	0.8	0.0	9.8
1994	511.8	815	17.8	2,343	51.0	826	18.0	587	12.8	19	0.4	4,590	1.6	4.6	0.9	1.1	0.0	9.0
1995	472.4	708	16.0	2,815	63.6	409	9.2	481	10.9	13	0.3	4,426	1.5	6.0	0.6	1.0	0.0	9.4
1996	849.5	2,294	48.1	1,610	33.8	551	11.6	301	6.3	14	0.3	4,770	2.7	1.9	1.0	0.4	0.0	5.6
1997	1,094.1	12,067	37.7	17,057	53.3	1,102	3.4	1,712	5.4	54	0.2	31,992	11.0	15.6	1.0	1.6	0.0	29.2
1999	206.0	1,004	33.5	1,301	43.4	211	7.0	464	15.5	16	0.5	2,996	4.9	6.3	1.2	2.3	0.1	14.5
2000	133.9	904	14.8	4,710	76.9	155	2.5	345	5.6	9	0.1	6,123	6.8	35.2	3.5	2.6	0.1	45.7
2001	145.1	898	13.6	4,705	71.4	501	7.6	477	7.2	13	0.2	6,594	6.2	32.4	3.2	3.3	0.1	45.4
2002	161.7	564	6.3	7,286	80.9	516	5.7	618	6.9	17	0.2	9,001	3.5	45.1	3.4	3.8	0.1	55.7
2003	179.5	2,331	34.5	3,367	49.9	602	8.9	442	6.5	12	0.2	6,754	13.0	18.8	1.4	2.5	0.1	37.6
2004	243.3	394	5.8	4,613	68.1	338	5.0	1,406	20.8	22	0.3	6,773	1.6	19.0	0.8	5.8	0.1	27.8
2005	314.3	582	13.2	2,131	48.5	250	5.7	1,420	32.3	13	0.3	4,396	1.9	6.8	0.8	4.5	0.0	14.0
2006	640.8	1,472	5.7	19,480	75.0	705	2.7	4,295	16.5	27	0.1	25,979	2.3	30.4	1.1	6.7	0.0	40.5
2007	242.9	554	14.4	2,349	61.1	152	4.0	786	20.4	6	0.2	3,847	2.3	9.7	0.6	3.2	0.0	15.8
2008	197.3	752	13.8	3,949	72.6	194	3.6	528	9.7	18	0.3	5,441	3.8	20.0	1.0	2.7	0.1	27.6
2009	631.4	1,061	1.9	50,671	91.5	1,262	2.3	2,363	4.3	33	0.1	55,390	1.7	80.3	2.0	3.7	0.1	87.7
2010	997.2	2,038	13.6	8,821	58.7	2,031	13.5	2,110	14.0	21	0.1	15,021	2.0	8.8	2.0	2.1	0.0	15.1
2011	961.0	1,338	6.9	9,775	50.3	5,093	26.2	3,202	16.5	23	0.1	19,431	1.4	10.2	5.3	3.3	0.0	20.2
2012	904.5	965	5.1	15,319	81.1	387	2.0	2,191	11.6	34	0.2	18,896	1.1	16.9	0.4	2.4	0.0	20.9
	Ave.: (1982-11)	13.9		67.9		9.3		8.7		0.2			2.4	0.0	11.6	0.1	1.6	17.0
	Min.: (1982-11)	1.9		33.8		2.3		1.1		0.1			0.4	1.7	0.2	0.1	0.0	2.7
	Max.: (1982-11)	48.1		91.5		26.2		32.3		1.9			13.0	80.3	5.3	6.7	0.1	87.7
	SD (1982-11)	10.8		14.1		6.9		7.1		0.4			2.9	16.3	1.2	1.7	0.0	18.6
pre 1998	Ave:	15.7		63.6		14.4		5.9		0.4			1.4	5.7	1.3	0.5	0.0	9.0
1998-present		12.3		71.1		6.2		10.2		0.1			3.8	22.1	1.9	3.2	0.0	31.0

Table 24.—Daily fish wheel catch by species for the south bank of the Yentna River, 2012.

Date	Hours open	Sockeye		Pink		Chum		Coho		Chinook	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
7 Jul	17.3	1	1	2	2	0	0	1	1	3	3
8 Jul	17.8	1	2	0	2	0	0	0	1	3	6
9 Jul	17.2	0	2	0	2	1	1	0	1	2	8
10 Jul	16.6	0	2	0	2	0	1	1	2	1	9
11 Jul	18.0	1	3	0	2	1	2	0	2	0	9
12 Jul	17.6	4	7	1	3	0	2	1	3	3	12
13 Jul	18.0	3	10	2	5	8	10	1	4	0	12
14 Jul	17.6	4	14	0	5	4	14	4	8	0	12
15 Jul	18.0	3	17	6	11	4	18	6	14	0	12
16 Jul	17.5	5	22	6	17	2	20	9	23	0	12
17 Jul	17.6	238	260	25	42	23	43	41	64	2	14
18 Jul	17.9	260	520	44	86	27	70	21	85	2	16
19 Jul	17.8	33	553	66	152	23	93	23	108	0	16
20 Jul	17.9	16	569	188	340	41	134	20	128	0	16
21 Jul	17.5	39	608	184	524	67	201	20	148	0	16
22 Jul	17.3	163	771	707	1,231	43	244	55	203	0	16
23 Jul	17.7	166	937	1063	2,294	36	280	51	254	0	16
24 Jul	17.3	153	1,090	1019	3,313	22	302	57	311	0	16
25 Jul	17.8	60	1,150	737	4,050	20	322	40	351	0	16
26 Jul	17.8	62	1,212	1094	5,144	27	349	80	431	1	17
27 Jul	17.9	59	1,271	2127	7,271	17	366	127	558	0	17
28 Jul	17.9	39	1,310	2118	9,389	22	388	167	725	0	17
29 Jul	18.0	15	1,325	1529	10,918	17	405	165	890	0	17
30 Jul	17.9	17	1,342	1197	12,115	17	422	151	1,041	0	17
31 Jul	17.7	21	1,363	1312	13,427	18	440	190	1,231	0	17
1 Aug	17.2	17	1,380	530	13,957	11	451	104	1,335	1	18
2 Aug	17.3	14	1,394	710	14,667	30	481	134	1,469	0	18
3 Aug	17.2	33	1,427	851	15,518	46	527	55	1,524	0	18
4 Aug	17.1	32	1,459	500	16,018	17	544	108	1,632	0	18
5 Aug	17.7	33	1,492	794	16,812	24	568	109	1,741	0	18
6 Aug	17.7	27	1,519	336	17,148	38	606	102	1,843	0	18
7 Aug	17.3	12	1,531	163	17,311	35	641	73	1,916	0	18
8 Aug	18.0	7	1,538	125	17,436	28	669	47	1,963	0	18
9 Aug	17.9	15	1,553	64	17,500	30	699	40	2,003	0	18
10 Aug	18.0	6	1,559	51	17,551	26	725	19	2,022	0	18
11 Aug	18.0	6	1,565	22	17,573	17	742	27	2,049	0	18
12 Aug	18.0	11	1,576	14	17,587	24	766	33	2,082	0	18
13 Aug	17.7	5	1,581	9	17,596	7	773	13	2,095	1	19
14 Aug	18.1	6	1,587	3	17,599	9	782	16	2,111	0	19
15 Aug	15.8	5	1,592	3	17,602	8	790	14	2,125	0	19
16 Aug	15.9	2	1,594	1	17,603	6	796	11	2,136	0	19
17 Aug	15.6	3	1,597	1	17,604	2	798	5	2,141	0	19
18 Aug	15.9	3	1,600	1	17,605	4	802	7	2,148	0	19
19 Aug	15.6	3	1,603	0	17,605	4	806	6	2,154	0	19
20 Aug	14.9	3	1,606	3	17,608	0	806	7	2,161	0	19

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Table 24.–Page 2 of 2.

Date	Hours open	Sockeye		Pink		Chum		Coho		Chinook	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
21 Aug	15.3	3	1,609	3	17,611	4	810	8	2,169	0	19
22 Aug	15.1	0	1,609	4	17,615	4	814	3	2,172	0	19
23 Aug	15.9	3	1,612	2	17,617	2	816	2	2,174	0	19
24 Aug	15.9	5	1,617	2	17,619	3	819	8	2,182	0	19
25 Aug	15.8	2	1,619	1	17,620	1	820	5	2,187	0	19
26 Aug	15.7	2	1,621	0	17,620	1	821	5	2,192	0	19
27 Aug	15.7	1	1,622	2	17,622	0	821	5	2,197	0	19
28 Aug	15.7	2	1,624	0	17,622	2	823	2	2,199	0	19
29 Aug	13.9	1	1,625	0	17,622	1	824	3	2,202	0	19
30 Aug	12.1	1	1,626	0	17,622	2	826	2	2,204	0	19
Percent:		7.3		79.0		3.7		9.9		0.1	
Total catch:	22,297	salmon		Hrs Operated:	933.5	CPUE (fish/hr):	23.9				
Trap efficiency (7 Jul–15Aug):	~8.2% of south bank sonar estimates (catch adjusted through 24 hours).										

Note: Other species included whitefish with a few longnose suckers, rainbow trout and Dolly Varden intermixed.

Table 25.—Summary of the fish wheel catch and CPUE by species for the south bank of the Yentna River, 1982–2012.

	Total Hours	Fish wheel catch - South bank									Total Catch	CPUE by species					Total CPUE	
		Sockeye	%	Pink	%	Chum	%	Coho	%	Chinook		Sockeye	Pink	Chum	Coho	Chinook		
1982	1,440.0	2,502	19.7	9,059	71.3	368	2.9	675	5.3	102	0.8	12,706	1.7	6.3	0.3	0.5	0.1	8.8
1983	1,506.5	3,715	58.7	1,822	28.8	391	6.2	361	5.7	37	0.6	6,326	2.5	1.2	0.3	0.2	0.0	4.2
1984	788.3	5,985	29.5	13,114	64.6	635	3.1	568	2.8	12	0.1	20,314	7.6	16.6	0.8	0.7	0.0	25.8
1985	883.1	5,616	35.7	8,855	56.2	521	3.3	724	4.6	35	0.2	15,751	6.4	10.0	0.6	0.8	0.0	17.8
1986	608.8	973	13.3	5,422	73.9	589	8.0	327	4.5	28	0.4	7,339	1.6	8.9	1.0	0.5	0.0	12.1
1987	824.2	2,216	32.5	3,333	48.8	966	14.1	293	4.3	20	0.3	6,828	2.7	4.0	1.2	0.4	0.0	8.3
1988	529.4	2,457	26.9	4,536	49.6	1,635	17.9	494	5.4	20	0.2	9,142	4.6	8.6	3.1	0.9	0.0	17.3
1989	818.1	3,856	27.7	7,169	51.5	1,804	12.9	1,081	7.8	23	0.2	13,932	4.7	8.8	2.2	1.3	0.0	17.0
1990	542.2	4,201	32.2	7,058	54.1	1,129	8.6	657	5.0	11	0.1	13,056	7.7	13.0	2.1	1.2	0.0	24.1
1991	445.0	5,368	42.7	3,368	26.8	877	7.0	2,936	23.4	10	0.1	12,559	12.1	7.6	2.0	6.6	0.0	28.2
1992	612.87	3,887	22.2	9,966	56.8	1,940	11.1	1,737	9.9	9	0.1	17,539	6.3	16.3	3.2	2.8	0.0	28.6
1993	446.5	8,561	34.7	12,416	50.3	1,508	6.1	2,178	8.8	25	0.1	24,688	19.2	27.8	3.4	4.9	0.1	55.3
1994	651.3	8,251	55.6	3,763	25.4	1,260	8.5	1,553	10.5	12	0.1	14,839	12.7	5.8	1.9	2.4	0.0	22.8
1995	456.3	2,737	36.3	2,335	31.0	691	9.2	1,766	23.4	11	0.1	7,540	6.0	5.1	1.5	3.9	0.0	16.5
1996	306.5	2,498	28.7	4,335	49.7	752	8.6	1,119	12.8	15	0.2	8,719	8.1	14.1	2.5	3.7	0.0	28.4
1997	318.2	5,431	79.5	672	9.8	317	4.6	397	5.8	18	0.3	6,835	17.1	2.1	1.0	1.2	0.1	21.5
1998	1,114.4	14,394	34.5	21,258	51.0	1,667	4.0	4,326	10.4	50	0.1	41,695	12.9	19.1	1.5	3.9	0.0	37.4
1999	206.3	3,790	42.4	3,213	35.9	223	2.5	1,689	18.9	34	0.4	8,949	18.4	15.6	1.1	8.2	0.2	43.4
2000	125.4	2,611	19.6	9,494	71.4	123	0.9	1,051	7.9	15	0.1	13,294	20.8	75.7	1.0	8.4	0.1	106.0
2001	157.7	2,527	27.7	4,369	47.8	460	5.0	1,755	19.2	20	0.2	9,131	16.0	27.7	2.9	11.1	0.1	57.9
2002	140.7	2,716	14.8	11,590	63.3	712	3.9	3,274	17.9	16	0.1	18,308	19.3	82.4	5.1	23.3	0.1	130.2
2003	146.7	6,095	44.9	4,927	36.3	869	6.4	1,659	12.2	15	0.1	13,565	41.5	33.6	5.9	11.3	0.1	92.5
2004	203.0	2,712	17.4	8,147	52.3	835	5.4	3,832	24.6	43	0.3	15,569	13.4	40.1	4.1	18.9	0.2	76.7
2005	277.6	2,588	26.2	2,280	23.1	571	5.8	4,433	44.9	12	0.1	9,884	9.3	8.2	2.1	16.0	0.0	35.6
2006	636.4	9,277	26.4	15,261	43.4	862	2.5	9,747	27.7	34	0.1	35,181	14.6	24.0	1.4	15.3	0.1	55.3
2007	240.4	2,998	51.8	1,410	24.4	261	4.5	1,117	19.3	2	0.0	5,788	12.5	5.9	1.1	4.6	0.0	24.1
2008	210.7	2,696	36.9	3,245	44.4	349	4.8	1,022	14.0	4	0.1	7,316	12.8	15.4	1.7	4.9	0.0	34.7
2009	629.9	6,901	9.7	55,213	77.8	2,254	3.2	6,569	9.3	33	0.0	70,970	11.0	87.7	3.6	10.4	0.1	112.7
2010	992.0	6,251	24.5	11,053	43.4	4,159	16.3	4,022	15.8	8	0.0	25,493	6.3	11.1	4.2	4.1	0.0	25.7
2011	976.2	4,348	17.1	6,550	25.8	11,310	44.6	3,164	12.5	7	0.0	25,379	4.5	6.7	11.6	3.2	0.0	26.0
2012	933.5	1,626	7.3	17,622	79.0	826	3.7	2,204	9.9	19	0.1	22,297	1.7	18.9	0.9	2.4	0.0	23.9
	Ave.: (1982–11)	27.7		51.2		8.0		12.9		0.1			8.0	0.1	14.8	0.1	2.3	28.9
	Min.: (1982–11)	9.7		9.8		0.9		2.8		0.0			1.6	1.2	0.3	0.2	0.0	4.2
	Max.: (1982–11)	79.5		77.8		44.6		44.9		0.8			41.5	87.7	11.6	23.3	0.2	130.2
	SD: (1982–11)	15.0		17.0		8.1		9.2		0.2			8.0	22.9	2.2	6.0	0.0	32.7
pre 1998	Ave %:	34.5		49.1		7.8		8.5		0.2			6.1	8.7	0.1	1.5	0.0	17.7
1998-present		22.2		54.4		7.9		15.4		0.1			10.2	25.1	3.6	7.1	0.0	46.2

Table 26.—Species composition from drift gill nets along the north bank of the Yentna River, 2012.

Date	Hrs	North Bank						Total Salmon	
		Sockeye	Pink	Chum	Coho	Chinook	Other	Total	Cum
7-12 Jul	0.00	ND	ND	ND	ND	ND	ND	ND	ND
13 Jul	0.60	2	0	0	0	0	0	2	-
14 Jul	0.90	1	0	2	1	0	0	4	-
15 Jul	0.58	2	1	0	1	0	0	4	-
16 Jul	0.88	3	0	1	2	0	0	6	6
17 Jul	0.87	17	2	4	2	0	0	25	31
18 Jul	0.92	48	2	9	5	0	1	64	95
19 Jul	0.88	11	1	4	2	0	1	18	113
20 Jul	0.90	3	10	13	3	1	0	30	143
21 Jul	0.87	13	4	14	3	0	0	34	177
22 Jul	0.82	13	7	4	0	0	0	24	201
23 Jul	0.90	20	19	5	3	0	0	47	248
24 Jul	0.90	16	15	5	7	0	0	43	291
25 Jul	0.90	10	10	3	3	0	0	26	317
26 Jul	0.90	12	43	10	10	0	0	75	392
27 Jul	0.80	5	49	10	10	0	0	74	466
28 Jul	0.85	6	76	7	12	0	0	101	567
29 Jul	0.90	5	28	18	10	0	0	61	628
30 Jul	0.90	3	21	8	3	0	0	35	663
31 Jul	0.90	3	22	9	4	0	0	38	701
1 Aug	0.88	2	16	9	16	0	0	43	744
2 Aug	0.90	1	25	10	8	0	0	44	788
3 Aug	0.90	1	8	11	6	0	0	26	814
4 Aug	0.90	2	12	16	7	0	0	37	851
5 Aug	0.83	1	25	10	2	0	0	38	889
6 Aug	0.88	0	18	13	9	0	0	40	929
7 Aug	0.90	0	10	15	15	0	0	40	969
8 Aug	0.90	1	8	16	0	0	0	25	994
9 Aug	0.90	2	1	3	5	0	0	11	1,005
10 Aug	0.90	1	3	3	2	0	0	9	1,014
11 Aug	0.98	0	2	5	1	0	0	8	1,022
12 Aug	0.90	3	1	4	0	0	0	8	1,030
13 Aug	1.02	0	1	1	2	0	0	4	1,034
14 Aug	0.00	ND	ND	ND	ND	ND	ND	ND	1,034
15 Aug	0.00	ND	ND	ND	ND	ND	ND	ND	1,034
Total	25.8	202	439	240	152	1	2	1,034	CPUE
Gill net %		19.5%	42.5%	23.2%	14.7%	0.1%	-	-	40.0
FW Total ^a	492.5	939	15,263	365	2,114	32	-	18,713	38.0
FW %		5.0%	81.6%	2.0%	11.3%	0.2%	-	-	-

Note: Comparison summary with the north bank fish wheel catch is provided at the bottom of the table.

^a Fish wheel totals for period 16 July–13 August only.

Table 27.—Species composition from drifting gill nets along the south bank of the Yentna River, 2012.

Date	Hrs	South Bank						Total Salmon	
		Sockeye	Pink	Chum	Coho	Chinook	Other	Total	Cum
7-12 Jul	0.00	ND	ND	ND	ND	ND	ND	ND	ND
13 Jul	0.55	0	0	1	1	0	0	2	-
14 Jul	0.30	0	0	0	0	0	0	0	-
15 Jul	0.20	1	0	0	0	0	0	1	-
16 Jul	0.90	2	0	0	1	0	0	3	3
17 Jul	0.82	10	1	1	3	0	0	15	18
18 Jul	0.97	19	0	8	1	0	0	28	46
19 Jul	0.90	9	2	2	4	0	0	17	63
20 Jul	0.88	5	6	17	4	0	0	32	95
21 Jul	0.90	10	7	8	7	0	1	32	127
22 Jul	0.93	5	2	0	1	0	0	8	135
23 Jul	0.90	36	18	2	5	0	0	61	196
24 Jul	0.90	17	18	4	8	0	0	47	243
25 Jul	0.90	13	9	8	8	0	0	38	281
26 Jul	0.92	18	36	9	8	0	0	71	352
27 Jul	0.87	10	31	11	9	0	0	61	413
28 Jul	0.90	3	23	10	15	0	0	51	464
29 Jul	0.90	4	17	9	14	0	0	44	508
30 Jul	0.90	3	17	14	12	0	0	46	554
31 Jul	0.85	3	6	7	4	0	0	20	574
1 Aug	0.90	5	7	5	6	0	0	23	597
2 Aug	0.90	3	11	11	4	0	0	29	626
3 Aug	0.88	3	5	6	6	0	0	20	646
4 Aug	0.90	1	5	2	6	0	0	14	660
5 Aug	0.90	2	6	13	6	0	0	27	687
6 Aug	0.90	3	18	18	22	1	0	62	749
7 Aug	0.90	3	6	10	17	0	0	36	785
8 Aug	0.88	3	4	13	7	0	0	27	812
9 Aug	0.90	1	3	8	7	0	0	19	831
10 Aug	0.88	1	0	1	2	0	0	4	835
11 Aug	0.90	0	1	1	1	0	0	3	838
12 Aug	0.90	0	0	0	2	0	0	2	840
13 Aug	0.90	0	0	3	0	0	0	3	843
14 Aug	0.00	ND	ND	ND	ND	ND	ND	ND	ND
15 Aug	0.00	ND	ND	ND	ND	ND	ND	ND	ND
Total	25.98	192	259	201	190	1	1	843	CPUE
Gill net %		22.8%	30.7%	23.8%	22.5%	0.1%	-	-	32.4
FW Total ^a	512.7	1,581	17,596	773	2,095	19	-	22,064	43.0
FW %		7.2%	79.7%	3.5%	9.5%	0.1%	-	-	-

Note: Comparison summary with the south bank fish wheel catch is provided at the bottom of the table.

^a Fish wheel totals for period 16 July–13 August only.

Table 28.-Gill net catches by bank. Total gill net catch (top), percentage by species by mesh size and comparison of species composition between mesh sizes and bank.

Bank	Mesh (cm)	Hrs	Total Net Catch by Species/Mesh						Total
			Sockeye	Pink	Chum	Coho	Chinook	Other	
North	12.1	8.4	60	169	31	54	1	0	314
	13.0	8.8	60	156	55	58	0	1	329
	15.2	8.7	82	114	154	40	0	1	390
	Total	25.9	202	439	240	152	1	2	1,033
South	12.1	8.5	76	104	45	86	0	0	311
	13.0	8.6	85	91	54	68	0	1	298
	15.2	8.6	31	64	102	36	1	0	233
	Total	25.7	192	259	201	190	1	1	842
Both	12.1	16.9	136	273	76	140	1	0	625
	13.0	17.4	145	247	109	126	0	2	627
	15.2	17.2	113	178	256	76	1	1	623
	Total	51.6	394	698	441	342	2	3	1875
% Catch/mesh size									
North	12.1	—	19.1%	53.8%	9.9%	17.2%	—	—	1.00
	13.0	—	18.2%	47.4%	16.7%	17.6%	—	—	1.00
	15.2	—	21.0%	29.2%	39.5%	10.3%	—	—	1.00
	Total	—	19.6%	42.5%	23.2%	14.7%	—	—	1.00
South	12.1	—	24.4%	33.4%	14.5%	27.7%	—	—	1.00
	13.0	—	28.5%	30.5%	18.1%	22.8%	—	—	1.00
	15.2	—	13.3%	27.5%	43.8%	15.5%	—	—	1.00
	Total	—	22.8%	30.8%	23.9%	22.6%	—	—	1.00
Both	12.1	—	21.8%	43.7%	12.2%	22.4%	—	—	1.00
	13.0	—	23.1%	39.4%	17.4%	20.1%	—	—	1.00
	15.2	—	18.1%	28.6%	41.1%	12.2%	—	—	1.00
	Total	—	21.0%	37.2%	23.5%	18.2%	—	—	1.00
CPUE/mesh size								R sq	Mesh sizes
North	12.1	—	7.1	20.1	3.7	6.4	—	0.9735	12.1 : 13.0
	13.0	—	6.8	17.7	6.2	6.6	—	0.0394	13.0 : 15.2
	15.2	—	9.4	13.1	17.7	4.6	—	0.0032	12.1 : 15.2
	Total	—	7.8	17.0	9.3	5.9	—	—	
South	12.1	—	8.9	12.2	5.3	10.1	—	0.6884	12.1 : 13.0
	13.0	—	9.9	10.6	6.3	7.9	—	0.3308	13.0 : 15.2
	15.2	—	3.6	7.5	11.9	4.2	—	0.3444	12.1 : 15.2
	Total	—	7.5	10.1	7.8	7.4	—	—	
Both	12.1	—	8.0	16.1	4.5	8.3	—	0.9558	12.1 : 13.0
	13.0	—	8.3	14.2	6.3	7.2	—	0.0001	13.0 : 15.2
	15.2	—	6.6	10.3	14.9	4.4	—	0.0278	12.1 : 15.2
	Total	—	7.6	13.5	8.6	6.6	—	0.9719	NB:SB
Catch similarity between same size mesh, R² values NB:SB									
12.1 = 0.678 13.0 = 0.471 15.2 = 0.816									

Table 29.—Age composition of sockeye salmon sampled from fish wheels on the Yentna River, 1983–2012.

Year	% Composition by Age Class										Other	n
	0.2	0.3	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4		
1983	0.4	0.4	4.7	66.9	22.6	0.2	0.9	1.7	1.7	0.0	0.5	1,024
1984	0.2	1.6	1.3	23.7	59.6	0.1	0.3	6.5	6.7	0.0	0.0	2,253
1985	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1986	1.0	1.1	0.0	21.2	65.3	0.2	0.3	4.7	6.2	0.0	0.0	688
1987	1.3	2.4	0.9	23.3	50.6	1.0	0.0	8.6	11.7	0.0	0.0	1,089
1988	2.7	2.4	0.4	33.5	41.9	0.2	1.7	6.5	10.4	0.1	0.0	1,727
1989	4.1	6.2	0.7	20.3	53.7	0.3	0.5	5.5	8.6	0.0	0.0	1,602
1990	0.8	2.4	0.3	29.9	47.6	0.7	0.1	9.8	8.2	0.1	0.2	1,916
1991	2.1	10.6	0.1	25.2	43.6	0.1	0.1	7.1	11.0	0.1	0.1	1,509
1992	1.6	0.7	1.0	31.4	29.2	0.1	0.4	17.1	18.2	0.1	0.4	1,451
1993	1.0	4.6	0.1	32.1	35.5	0.0	0.4	11.7	14.5	0.1	0.0	1,390
1994	1.3	3.9	0.6	23.2	43.2	0.2	0.0	9.7	17.6	0.0	0.3	637
1995	2.2	5.1	0.8	19.7	51.3	0.4	0.2	8.5	11.6	0.0	0.2	507
1996	3.2	3.2	0.4	25.5	43.8	0.0	0.4	9.4	14.0	0.0	0.0	466
1997	1.1	10.5	0.1	32.4	43.7	0.1	0.1	4.7	7.2	0.0	0.1	751
1998	0.7	5.7	0.3	15.7	62.7	0.3	0.0	4.0	10.5	0.0	0.0	1,500
1999	3.6	3.4	0.0	23.4	52.0	0.9	0.0	8.6	8.1	0.0	0.0	444
2000	0.0	5.9	0.0	8.6	61.5	0.2	0.0	3.3	20.2	0.2	0.0	546
2001	0.0	3.4	0.8	21.3	47.8	0.0	0.4	8.4	17.7	0.0	0.2	475
2002	1.7	2.0	0.7	28.8	51.0	0.0	0.0	5.5	10.2	0.0	0.2	459
2003	0.5	2.5	0.1	16.1	63.6	0.4	0.5	6.0	10.3	0.0	0.0	812
2004	0.6	1.1	0.7	17.0	50.0	0.6	0.0	8.3	21.7	0.0	0.0	460
2005	0.5	4.0	1.7	22.7	54.4	0.1	0.1	6.2	10.1	0.0	0.2	823
2006	2.2	3.1	0.5	44.0	39.3	0.2	0.0	5.0	5.8	0.0	0.0	605
2007	1.9	3.6	0.3	18.9	60.9	0.0	0.6	6.3	7.4	0.0	0.1	366
2008	0.8	6.3	1.6	11.8	56.0	0.5	1.1	7.6	13.9	0.0	0.4	382
2009	2.9	2.9	1.5	33.9	31.6	0.8	2.1	17.2	7.2	0.0	0.0	664
2010	12.5	4.2	1.6	39.4	23.3	0.0	1.5	5.8	11.5	0.0	0.2	879
2011	0.4	18.1	0.9	11.3	55.9	0.2	4.3	3.9	5.1	0.0	0.0	565
2012	2.0	2.0	0.0	19.4	43.7	2.0	4.5	10.7	12.7	0.0	0.0	355
Ave. (1983-11)	1.8	4.1	0.8	27.0	47.3	0.3	0.5	7.6	10.5	0.0	0.1	896

Table 30.—Average lengths by age class of sockeye salmon sampled from the Yentna River fish wheels, 1987–2012.

Year	Age Class	Male		Female		Both		Male-Female
		Length (mm)	n	Length (mm)	n	Length (mm)	n	
1987	1.2	484	158	477	156	480	314	1.0:1
1988		465	408	485	170	471	578	2.4:1
1989		454	239	479	89	461	328	2.7:1
1990		446	305	446	238	446	543	1.3:1
1991		460	253	484	130	468	383	1.9:1
1992		444	360	470	115	450	475	3.1:1
1993		465	279	484	167	472	446	1.7:1
1994		468	107	484	41	473	148	2.6:1
1995		460	58	472	42	465	100	1.4:1
1996		463	78	469	41	465	119	1.9:0
1997		479	110	479	133	479	243	0.8:1
1998		485	104	486	132	486	236	0.8:1
1999		469	56	484	48	476	104	1.2:1
2000		462	35	458	12	461	47	2.9:1
2001		477	53	490	48	483	101	1.1:1
2002		486	76	495	56	490	132	1.4:1
2003		473	77	486	54	478	131	1.4:1
2004		466	53	490	25	474	78	2.1:1
2005		456	125	466	62	459	187	2.0:1
2006		485	134	487	132	486	266	1.0:1
2007		455	43	483	26	466	69	1.7:1
2008		456	40	482	5	459	45	8.0:1
2009		472	139	488	86	478	225	1.6:1
2010		462	208	478	138	468	346	1.5:1
2011		452	35	497	29	472	64	1.2:1
2012		475	40	478	29	476	69	1.4:1
Average (1986-11)		464	140	478	86	469	226	1.6:1
1987	1.3	590	246	565	222	579	468	1.1:1
1988		583	365	551	359	568	724	1.0:1
1989		578	392	555	450	565	842	0.9:1
1990		573	400	552	526	561	926	0.8:1
1991		562	301	542	356	551	657	0.8:1
1992		546	188	543	242	544	430	0.8:1
1993		561	228	549	266	554	494	0.9:1
1994		596	133	561	142	578	275	0.9:1
1995		568	124	545	136	556	260	0.9:1
1996		589	107	568	97	579	204	1.1:1
1997		585	155	555	173	569	328	0.9:1
1998		562	453	538	487	550	940	0.9:1
1999		581	135	553	96	569	231	1.4:1
2000		600	180	568	156	585	336	1.2:1
2001		586	111	555	116	570	227	1.0:1
2002		596	113	561	121	578	234	0.9:1
2003		576	270	548	246	563	516	1.1:1
2004		574	93	553	137	562	230	0.7:1
2005		568	222	546	226	557	448	1.0:1
2006		567	99	554	139	559	238	0.7:1
2007		575	109	552	114	563	223	1.0:1
2008		571	99	555	115	563	214	0.9:1
2009		580	92	557	118	567	210	0.8:1
2010		569	79	548	126	556	205	0.6:1
2011		577	166	561	150	570	316	1.1:1
2012		581	77	555	78	568	155	1:1
Average (1986-11)		575	194	552	213	563	406	0.9:1

-continued-

Table 30.—Page 2 of 2.

Year	Age Class	Male		Female		Both		Male-Female
		Length (mm)	n	Length (mm)	n	Length (mm)	n	
1987	2.2	480	48	490	76	487	124	0.6:1
1988		474	75	491	38	481	113	2.0:1
1989		479	45	490	48	485	93	0.9:1
1990		462	91	455	100	459	191	0.9:1
1991		478	57	477	50	478	107	1.1:1
1992		452	181	471	53	456	234	3.4:1
1993		476	93	487	69	481	162	1.3:1
1994		487	30	490	32	488	62	0.9:1
1995		472	23	488	20	479	43	1.2:1
1996		472	21	498	23	486	44	0.9:1
1997		497	15	460	20	475	35	0.8:1
1998		482	36	487	24	484	60	1.5:1
1999		483	16	491	22	487	38	0.7:1
2000		470	10	477	8	473	18	1.3:1
2001		487	19	482	21	485	40	0.9:1
2002		482	16	486	9	483	25	1.8:1
2003		472	23	486	26	480	49	0.9:1
2004		474	24	486	14	478	38	1.7:1
2005		462	29	488	22	473	51	1.3:1
2006		500	17	490	13	496	30	1.3:1
2007		471	8	493	15	486	23	0.5:1
2008		468	19	495	10	477	29	1.9:1
2009		492	73	495	41	493	114	1.8:1
2010		468	26	487	25	477	51	1.0:1
2011		474	15	488	7	479	22	2.1:1
2012		474	17	483	21	479	38	0.8:1
Average (1986-11)		472	40	484	31	477	71	1.3:1
1987	2.3	583	62	565	52	576	114	1.2:1
1988		587	92	558	87	574	179	1.1:1
1989		565	68	549	75	557	143	0.9:1
1990		574	73	542	96	555	169	0.8:1
1991		561	78	536	86	547	164	0.9:1
1992		564	123	538	126	551	249	1.0:1
1993		562	74	544	128	550	202	0.6:1
1994		600	56	561	56	580	112	1.0:1
1995		578	25	544	34	559	59	0.7:1
1996		585	31	558	34	571	65	0.9:1
1997		575	34	548	20	565	54	1.7:1
1998		558	82	534	76	547	158	1.1:1
1999		585	16	546	20	563	36	0.8:1
2000		597	55	563	55	580	110	1.0:1
2001		575	34	552	50	561	84	0.7:1
2002		589	21	551	26	568	47	0.8:1
2003		562	50	543	34	555	84	1.5:1
2004		579	41	551	59	560	100	0.7:1
2005		557	32	537	51	545	83	0.6:1
2006		562	13	553	22	556	35	0.6:1
2007		568	12	544	15	555	27	0.8:1
2008		565	26	535	27	550	53	1.0:1
2009		560	18	548	30	553	48	0.6:1
2010		559	39	545	62	551	101	0.6:1
2011		564	14	544	15	554	29	0.9:1
2012		571	23	540	22	556	45	1:1
Average (1986-11)		573	46	547	53	559	99	0.9:1
2012 summary (all ages)		528	182	514	173	521	355	1.1:1

Note: Data available for 1983, 1986 and 1987.

Table 31.—Index (ground or aerial counts) and weir counts of salmon in various northern district spawning areas in 2012.

Water Body-method-source	Number of Fish Observed or Estimated				
	Sockeye	Pink	Chum	Coho	Chinook
Alexander Creek (aerial survey, ADF&G, SF)	0	0	0	0	181
Birch Creek (aerial survey, ADF&G, SF)	0	0	0	276	0
Cache Creek (aerial survey ADF&G, SF)	0	0	0	0	87
Chelatna Lake (weir, CIAA) ^a	36,736	616	7	14	0
Chuitna River (aerial survey, ADF&G, CF)	0	0	0	0	502
Chulitna River (aerial survey, ADF&G, SF)	0	0	0	0	667
Clear Creek (aerial survey, ADF&G, SF)	0	0	0	0	1,177
Coal Creek (aerial survey, ADF&G, SF)	0	0	0	0	184
Cottonwood Creek (foot survey, ADF&G, SF)	0	0	0	467	0
Deception Creek (aerial survey, ADF&G, SF)	0	0	0	0	349
Deshka River (weir, ADF&G, SF)	51	78,853	113	6,825	14,096
Fish Creek (weir, ADF&G, SF)	18,813	0	0	1,237	0
Goose Creek (aerial survey, ADF&G, SF)	0	0	0	0	57
Indian River (aerial survey, ADF&G, SF)	0	0	0	0	338
Jim Creek, Upper (foot survey, ADF&G, SF)	0	0	0	495	0
Judd Lake (weir, CIAA)	18,715	635	168	176	3
Kashwitna River (aerial survey, ADF&G, SF)	0	0	0	0	85
Knik Arm index (aerial surveys, ADF&G, SF)	0	0	0	0	1,317
Lake Creek (aerial survey, ADF&G, SF)	0	0	0	0	2,366
Larson L (weir CIAA)	16,557	17	0	4	0
Lewis River (aerial survey, ADF&G, SF)	0	0	0	0	107
Little Susitna (weir/aerial survey, ADF&G, SF)	236	4,476	23,846	6,779	1,154
Little Willow Creek (aerial survey, ADF&G, SF)	0	0	0	0	494
McRoberts Creek (foot survey, ADF&G, SF)	0	0	0	213	0
Montana Creek (aerial survey, ADF&G, SF)	0	0	0	0	416
Moose Creek (aerial survey, ADF&G, SF)	0	0	0	0	163
Peters Creek (foot survey, ADF&G, SF)	0	0	0	0	459
Portage Creek (aerial survey, ADF&F, SF)	0	0	0	0	501
Prairie Creek (aerial survey, ADF&G, SF)	0	0	0	0	1,185
Question Creek (aerial survey, ADF&G, SF)	0	0	0	75	0
Sheep Creek (survey, ADF&G, SF)	0	0	0	0	363
Susitna River Index (aerial surveys, ADF&G, SF)	0	0	0	0	10,536
Talachulitna River (aerial, ADF&G, CF)	0	0	0	0	847
Theodore River (aerial, ADF&G, CF)	0	0	0	0	179
West Cook Inlet index (aerial surveys, ADF&G, SF)	0	0	0	0	1,186
Willow Creek (aerial survey, ADF&G, SF)	0	0	0	0	756
Total Susitna/Yentna River watershed index	72,295	84,597	24,134	16,561	39,755
Combined weir counts (Chelatna+Judd)	55,451				
Susitna index (SEG = Chelatna + Judd + Larson)	72,008				

Table 32.—Estimated salmon migration by species into the Crescent River, 2012, using Bendix side-looking sonar.

Date	Sockeye		Pink		Chum		Chinook		Dolly Varden	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
24 Jun	191	191	0	0	0	0	0	0	0	0
25 Jun	189	380	0	0	0	0	0	0	0	0
26 Jun	424	804	0	0	0	0	0	0	0	0
27 Jun	153	957	0	0	0	0	0	0	0	0
28 Jun	1,642	2,599	0	0	0	0	0	0	0	0
29 Jun	4,709	7,308	0	0	0	0	0	0	0	0
30 Jun	2,001	9,309	0	0	0	0	0	0	0	0
1 Jul	7,407	16,716	0	0	0	0	0	0	0	0
2 Jul	3,463	20,179	0	0	0	0	0	0	0	0
3 Jul	2,112	22,291	0	0	0	0	0	0	0	0
4 Jul	625	22,916	0	0	0	0	0	0	0	0
5 Jul	1,283	24,199	0	0	0	0	0	0	0	0
6 Jul	3,003	27,202	0	0	0	0	0	0	0	0
7 Jul	4,132	31,334	0	0	0	0	0	0	0	0
8 Jul	2,351	33,685	0	0	0	0	0	0	0	0
9 Jul	851	34,536	0	0	0	0	0	0	0	0
10 Jul	644	35,180	0	0	0	0	0	0	0	0
11 Jul	649	35,829	0	0	0	0	0	0	0	0
12 Jul	680	36,509	0	0	0	0	0	0	0	0
13 Jul	841	37,350	0	0	0	0	0	0	0	0
14 Jul	1,844	39,194	0	0	0	0	0	0	0	0
15 Jul	1,073	40,267	0	0	0	0	0	0	0	0
16 Jul	1,630	41,897	0	0	0	0	0	0	0	0
17 Jul	963	42,860	0	0	0	0	0	0	0	0
18 Jul	643	43,503	64	64	0	0	0	0	65	65
19 Jul	1,240	44,743	0	64	0	0	0	0	0	65
20 Jul	2,450	47,193	0	64	33	33	8	8	41	106
21 Jul	4,024	51,217	0	64	69	102	0	8	0	106
22 Jul	972	52,189	0	64	54	156	0	8	0	106
23 Jul	1,875	54,064	0	64	54	210	0	8	0	106
24 Jul	1,814	55,878	0	64	78	288	0	8	0	106
25 Jul	817	56,695	0	64	19	307	0	8	0	106
26 Jul	487	57,182	0	64	0	307	0	8	33	139
27 Jul	544	57,726	0	64	24	331	0	8	75	214
28 Jul	574	58,300	0	64	30	361	0	8	181	395
29 Jul	538	58,838	0	64	32	393	0	8	131	526
Percent:	98.3%		0.1%		0.7%		0.0%		0.9%	
Total (all species):	59,829									

Note: Estimates for species other than sockeye salmon are not indicative of run strength for that species.

Table 33.—Cumulative proportion by date of sockeye salmon escapement recorded in the Crescent River, 1996–2012.

Date	Cumulative Proportion															
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2010	2011	2012
22 Jun	0.001	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
23 Jun	0.006	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24 Jun	0.008	0.004	—	—	—	—	—	—	0.023	0.012	0.001	0.005	0.001	0.036	0.022	0.003
25 Jun	0.011	0.014	—	—	—	—	—	—	0.036	0.034	0.001	0.010	0.001	0.049	0.044	0.006
26 Jun	0.012	0.020	—	—	—	—	—	—	0.045	0.050	0.002	0.012	0.002	0.097	0.049	0.014
27 Jun	0.013	0.029	0.009	0.001	—	—	0.016	0.037	0.062	0.065	0.024	0.021	0.003	0.128	0.051	0.016
28 Jun	0.015	0.037	0.016	0.002	—	0.006	0.072	0.071	0.088	0.079	0.045	0.078	0.003	0.174	0.052	0.044
29 Jun	0.018	0.049	0.022	0.007	0.001	0.008	0.112	0.108	0.127	0.092	0.070	0.104	0.006	0.205	0.062	0.124
30 Jun	0.036	0.058	0.031	0.038	0.002	0.016	0.149	0.139	0.139	0.110	0.091	0.145	0.008	0.235	0.098	0.158
1 Jul	0.060	0.067	0.034	0.086	0.006	0.036	0.186	0.159	0.153	0.134	0.112	0.168	0.014	0.263	0.122	0.284
2 Jul	0.074	0.091	0.038	0.115	0.008	0.074	0.225	0.172	0.182	0.151	0.124	0.210	0.055	0.290	0.138	0.343
3 Jul	0.087	0.153	0.040	0.137	0.011	0.136	0.271	0.182	0.215	0.169	0.132	0.232	0.078	0.311	0.178	0.379
4 Jul	0.105	0.188	0.043	0.161	0.028	0.199	0.310	0.205	0.240	0.199	0.143	0.255	0.124	0.342	0.222	0.389
5 Jul	0.129	0.214	0.044	0.184	0.093	0.253	0.351	0.225	0.266	0.224	0.158	0.271	0.145	0.368	0.252	0.411
6 Jul	0.148	0.239	0.045	0.204	0.178	0.307	0.398	0.246	0.289	0.238	0.170	0.293	0.159	0.402	0.276	0.462
7 Jul	0.161	0.267	0.056	0.215	0.292	0.338	0.440	0.307	0.306	0.253	0.185	0.310	0.210	0.431	0.303	0.533
8 Jul	0.174	0.300	0.084	0.247	0.365	0.356	0.465	0.323	0.325	0.272	0.205	0.324	0.260	0.443	0.328	0.573
9 Jul	0.181	0.348	0.142	0.267	0.399	0.383	0.480	0.337	0.342	0.295	0.221	0.341	0.320	0.478	0.342	0.587
10 Jul	0.189	0.429	0.196	0.278	0.410	0.399	0.489	0.351	0.358	0.321	0.241	0.359	0.384	0.508	0.353	0.598
11 Jul	0.197	0.500	0.237	0.284	0.418	0.449	0.497	0.356	0.391	0.344	0.268	0.393	0.412	0.554	0.369	0.609
12 Jul	0.202	0.550	0.272	0.328	0.422	0.471	0.521	0.376	0.438	0.362	0.290	0.418	0.472	0.588	0.401	0.621
13 Jul	0.262	0.581	0.294	0.375	0.426	0.505	0.562	0.492	0.506	0.393	0.312	0.437	0.526	0.615	0.435	0.635
14 Jul	0.391	0.606	0.320	0.403	0.433	0.557	0.614	0.526	0.578	0.422	0.344	0.453	0.585	0.643	0.485	0.666
15 Jul	0.471	0.625	0.348	0.410	0.444	0.595	0.628	0.554	0.622	0.436	0.397	0.471	0.632	0.663	0.592	0.684
16 Jul	0.513	0.654	0.389	0.458	0.494	0.638	0.648	0.587	0.648	0.448	0.421	0.486	0.653	0.694	0.664	0.712
17 Jul	0.551	0.691	0.434	0.548	0.658	0.677	0.673	0.624	0.672	0.473	0.439	0.518	0.684	0.719	0.725	0.728
18 Jul	0.595	0.719	0.487	0.600	0.795	0.697	0.682	0.687	0.696	0.506	0.449	0.580	0.730	0.748	0.767	0.739
19 Jul	0.653	0.734	0.546	0.645	0.863	0.706	0.707	0.729	0.718	0.532	0.462	0.612	0.771	0.771	0.809	0.760
20 Jul	0.692	0.747	0.590	0.703	0.882	0.727	0.732	0.754	0.741	0.549	0.504	0.649	0.795	0.802	0.833	0.802
21 Jul	0.729	0.759	0.606	0.729	0.924	0.765	0.784	0.785	0.759	0.589	0.537	0.696	0.828	0.821	0.853	0.870
22 Jul	0.746	0.774	0.622	0.780	0.940	0.803	0.809	0.806	0.775	0.616	0.560	0.720	0.860	0.840	0.864	0.887

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Table 33.–Page 2 of 2.

Date	Cumulative Proportion															
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2010	2011	2012
23 Jul	0.757	0.793	0.680	0.815	0.942	0.845	0.829	0.826	0.803	0.656	0.590	0.7453	0.876	0.862	0.882	0.919
24 Jul	0.775	0.814	0.714	0.841	0.948	0.871	0.835	0.842	0.814	0.685	0.601	0.7688	0.883	0.886	0.898	0.950
25 Jul	0.812	0.833	0.726	0.860	0.954	0.898	0.888	0.864	0.824	0.694	0.640	0.8164	0.896	0.901	0.943	0.964
26 Jul	0.864	0.847	0.742	0.881	0.960	0.930	0.929	0.888	0.833	0.738	0.672	0.8547	0.909	0.919	0.954	0.972
27 Jul	0.893	0.865	0.769	0.904	0.968	0.950	0.965	0.906	0.836	0.757	0.698	0.8749	0.924	0.929	0.961	0.981
28 Jul	0.910	0.885	0.785	0.933	0.969	0.958	0.987	0.917	0.843	0.781	0.722	0.8838	0.942	0.936	0.972	0.991
29 Jul	0.924	0.901	0.819	0.960	0.982	0.972	1.000	0.932	0.889	0.803	0.736	0.8923	0.958	0.944	0.984	1.000
30 Jul	0.948	0.926	0.853	0.969	0.985	0.983	–	0.947	0.914	0.845	0.754	0.9066	0.976	0.954	0.990	–
31 Jul	0.965	0.944	0.890	0.974	0.993	0.992	–	0.969	0.930	0.873	0.785	0.9249	0.982	0.961	0.993	–
01 Aug	0.985	0.959	0.919	0.979	1.000	1.000	–	0.978	0.949	0.891	0.820	0.9367	0.992	0.970	1.000	–
02 Aug	1.000	0.972	0.934	0.988	–	–	–	0.987	0.965	0.903	0.850	0.9473	1.000	0.981	–	–
03 Aug	–	0.983	0.949	0.992	–	–	–	1.000	0.979	0.923	0.901	0.957	–	0.987	–	–
04 Aug	–	0.991	0.962	1.000	–	–	–	–	0.992	0.946	0.917	0.9717	–	0.992	–	–
05 Aug	–	1.000	0.977	–	–	–	–	–	1.000	0.956	0.936	0.9814	–	1.000	–	–
06 Aug	–	–	0.990	–	–	–	–	–	–	0.972	0.948	0.9907	–	–	–	–
07 Aug	–	–	1.000	–	–	–	–	–	–	1.000	0.965	1.000	–	–	–	–
08 Aug	–	–	–	–	–	–	–	–	–	–	0.976	–	–	–	–	–
09 Aug	–	–	–	–	–	–	–	–	–	–	0.989	–	–	–	–	–
10 Aug	–	–	–	–	–	–	–	–	–	–	–	1.000	–	–	–	–
Midpoint	16 Jul	11 Jul	19 Jul	27 Jul	17 Jul	13 Jul	12 Jul	14 Jul	13 Jul	18 Jul	20 Jul	17 Jul	13 Jul	10 Jul	15 Jul	7 Jul
Ave. midpoint:	1984–11,	16 July														
No. days																
for 80%	25	27	24	26	16	24	28	29	32	34	34	32	23	29	25	25
Ave. for 80% of the run:	1984–2011,	27 d														
1996–11: 15 July																
1996–2011: 29 d																

Note: No data available for 2009.

Table 34.—Average Bendix sonar counts by sector for the north and south banks of the Crescent River, 2012.

Crescent River	Bendix Range (m)											
	Sector											
	1	2	3	4	5	6	7	8	9	10	11	12
North Bank												
Daily %	7.0	12.7	20.3	22.8	15.4	11.4	4.7	3.3	1.5	0.7	0.2	0.2
Cum. %	7.0	19.7	39.9	62.7	78.0	89.5	94.1	97.4	99.0	99.7	99.8	100.0
Average (m):	0.5	1.0	1.5	2.0	2.5	3.1	3.6	4.1	4.6	5.1	5.6	6.1
Min. & max. counting ranges:	5.2	6.7				Dead range = 0.3				Std dev	0.4	
South Bank												
Daily %	4.5	12.9	26.2	22.3	16.6	9.6	4.5	2.3	0.7	0.2	0.1	0.2
Cum. %	4.5	17.5	43.6	65.9	82.4	92.0	96.5	98.8	99.5	99.7	99.8	100.0
Average (m):	0.4	0.7	1.1	1.4	1.8	2.2	2.5	2.9	3.2	3.6	3.9	4.3
Min. & max. counting ranges:	3.8	5.2				Dead range = 0.3				Std dev	0.3	

Note: To determine total range from transducer, add dead range to counting range.

Table 35.—Crescent River daily fish wheel catch (top) and gill net catch (bottom), 2012.

Date	Hours	Sockeye		Pink		Chum		Coho		Chinook		Dolly Varden	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
24 Jun	12.0	2	0	0	0	0	0	0	0	0	0	0	0
25 Jun	24.0	3	3	0	0	0	0	0	0	0	0	0	0
26 Jun	24.0	4	7	0	0	0	0	0	0	0	0	0	0
27 Jun	24.0	1	8	0	0	0	0	0	0	0	0	0	0
28 Jun	24.0	4	12	0	0	0	0	0	0	0	0	0	0
29 Jun	24.0	3	15	0	0	0	0	0	0	0	0	0	0
30 Jun	24.0	1	16	0	0	0	0	0	0	0	0	0	0
1 Jul	24.0	4	20	0	0	0	0	0	0	0	0	0	0
2 Jul	24.0	14	34	0	0	0	0	0	0	0	0	0	0
3 Jul	24.0	4	38	0	0	0	0	0	0	0	0	0	0
4 Jul	24.0	2	40	0	0	0	0	0	0	0	0	0	0
5 Jul	24.0	1	41	0	0	0	0	0	0	0	0	0	0
6 Jul	24.0	2	43	0	0	0	0	0	0	0	0	0	0
7 Jul	24.0	3	46	0	0	0	0	0	0	0	0	0	0
8 Jul	24.0	2	48	0	0	0	0	0	0	0	0	0	0
9 Jul	24.0	3	51	0	0	0	0	1	1	0	0	0	0
10 Jul	24.0	0	51	0	0	0	0	0	1	0	0	0	0
11 Jul	24.0	2	53	0	0	0	0	0	1	0	0	0	0
12 Jul	24.0	2	55	0	0	0	0	0	1	0	0	0	0
13 Jul	24.0	0	55	0	0	0	0	0	1	0	0	0	0
14 Jul	24.0	1	56	0	0	0	0	0	1	0	0	0	0
15 Jul	16.0	0	56	0	0	0	0	0	1	0	0	0	0
16 Jul	16.0	0	56	0	0	0	0	0	1	0	0	0	0
17 Jul	16.0	0	56	0	0	0	0	0	1	0	0	0	0
18 Jul	16.0	0	56	0	0	0	0	0	1	0	0	0	0
19 Jul	24.0	10	66	0	0	0	0	0	1	0	0	0	0
20 Jul	24.0	297	363	0	0	4	4	0	1	1	1	5	5
21 Jul	6.0	59	422	0	0	1	5	0	1	0	1	0	5
22 Jul	10.0	54	476	0	0	3	8	0	1	0	1	0	5
23 Jul	8.0	35	511	0	0	1	9	0	1	0	1	0	5
24 Jul	16.0	3	514	0	0	0	9	0	1	0	1	0	5
25 Jul	24.0	6	520	0	0	0	9	0	1	0	1	0	5
26 Jul	24.0	6	526	0	0	0	9	0	1	0	1	1	6
27 Jul	24.0	10	536	0	0	1	10	0	1	0	1	2	8
28 Jul	24.0	19	555	0	0	1	11	0	1	0	1	6	14
29 Jul	24.0	4	559	0	0	0	11	0	1	0	1	0	14

Proportion: 95.4% 0.0% 1.9% 0.2% 0.2% 2.4%
 Totals: Catch (fish): 586 Time Operated (hrs): 764.0 CPUE (fish/hr): 0.8
 Efficiency: 3.0% (catch adjusted to 24 hrs) of the total south bank sonar count

Gill Net Catch													
	Sockeye		Pink		Chum		Coho		Chinook		Dolly Varden		
Hrs	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	
24 Jun - 17 Jul	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
17 Jul	2.0	2	2	0	0	0	0	0	0	0	0	0	0
18 Jul	2.0	10	12	1	1	0	0	0	0	0	0	1	1
19 Jul	2.0	16	28	0	1	1	1	0	0	0	0	1	2
20-25 Jul	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
26 Jul	2.0	6	34	0	1	1	2	0	0	0	0	0	2
27-29 Jul	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Proportion: 87.2% 2.6% 5.1% 0.0% 0.0% 5.1%
 Totals: Catch (fish): 39 Time Operated (hrs): 8.0 CPUE (fish/hr): 4.9

Table 36.—Historic fish wheel catch by species for the Crescent River, 1993–2012.

	Hours	Actual fish wheel catch										Total	
		Sockeye	%	Pink	%	Chum	%	Coho	%	Chinook	%	DV	%
1993	359.0	2,336	78.9	211	7.1	269	9.1	0	0.0	0	0.0	146	4.9
1994	918.5	1,269	59.8	34	1.6	256	12.1	6	0.3	8	0.4	548	25.8
1995	775.0	1,539	81.7	55	2.9	126	6.7	14	0.7	17	0.9	132	7.0
1996	1,005.0	1,028	79.2	7	0.5	109	8.4	2	0.2	6	0.5	146	11.2
1997	1,031.0	1,575	79.1	290	14.6	51	2.6	0	0.0	5	0.3	69	3.5
1998	1,007.0	2,059	93.8	32	1.5	65	3.0	6	0.3	16	0.7	18	0.8
1999	936.0	1,307	53.9	588	24.3	58	2.4	0	0.0	48	2.0	423	17.5
2000	786.0	646	91.9	9	1.3	7	1.0	2	0.3	4	0.6	35	5.0
2001	860.0	527	83.1	30	4.7	23	3.6	0	0.0	2	0.3	52	8.2
2002	611.0	1,017	82.1	10	0.8	18	1.5	0	0.0	8	0.6	186	15.0
2003	450.0	2,278	84.1	62	2.3	214	7.9	4	0.1	25	0.9	125	4.6
2004	176.5	1,582	92.6	30	1.8	28	1.6	1	0.1	11	0.6	57	3.3
2005	403.0	2,844	90.2	157	5.0	24	0.8	1	0.0	27	0.9	99	3.1
2006	841.0	2,210	92.4	61	2.6	48	2.0	10	0.4	8	0.3	54	2.3
2007	1,032.0	769	90.4	20	2.4	4	0.5	1	0.1	1	0.1	56	6.6
2008	892.0	582	95.7	3	0.5	7	1.2	0	0.0	11	1.8	5	0.8
2009													
2010	609.8	1,815	93.3	19	1.0	81	4.2	0	0.0	1	0.1	29	1.5
2011	765.2	1,241	86.1	55	3.8	48	3.3	0	0.0	0	0.0	98	6.8
2012	764.0	559	95.4	0	0.0	11	1.9	1	0.2	1	0.2	14	2.4
ave:	747.7	1,479	82.5	93	5.2	80	4.5	3	0.1	11	0.6	127	7.1
min:	176.5	527	53.9	3	0.5	4	0.5	0	0.0	0	0.0	5	0.8
max:	1,032.0	2,844	95.7	588	24.3	269	12.1	14	0.7	48	2.0	548	25.8
SD:	—	—	11.3	—	6.0	—	3.4	—	0.2	—	0.6	—	6.6
CPUE													
2012	—	0.7	—	0.0	—	0.0	—	0.0	—	0.0	—	0.0	—
ave:	—	2.0	—	0.1	—	0.1	—	0.0	—	0.0	—	0.2	—
min:	—	0.6	—	0.0	—	0.0	—	0.0	—	0.0	—	0.0	—
max:	—	9.0	—	0.6	—	0.7	—	0.1	—	0.1	—	0.6	—
SD:	—	2.5	—	0.2	—	0.2	—	0.0	—	0.0	—	0.2	—

Note: No data available for 2009.

Table 37.—Age composition of sockeye salmon sampled from the Crescent River, 1979–2012.

Year	Percentage Composition by Age Class								n
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	Other	
1979	0.8	30.9	67.4	0.1	0.1	0.7	0.0	0.0	643
1980	0.0	6.6	87.4	1.8	0.0	2.6	1.6	0.0	511
1981	0.0	8.0	34.0	0.1	0.1	10.6	47.2	0.0	1,117
1982	0.0	12.9	79.2	0.1	0.0	0.8	7.0	0.0	711
1983	0.0	10.9	42.3	0.2	0.6	27.4	18.6	0.0	731
1984	0.0	3.5	16.9	0.0	0.0	20.0	59.4	0.2	780
1985	0.2	4.7	31.3	0.0	0.3	20.5	43.0	0.0	594
1986	0.0	6.5	15.8	0.0	0.0	13.0	64.0	0.7	139
1987	0.0	2.6	47.7	0.0	0.0	4.2	45.0	0.5	191
1988	0.0	10.4	44.9	0.5	0.1	17.8	26.1	0.1	741
1989	0.0	0.7	45.4	0.1	0.0	2.0	51.2	0.6	711
1990	0.0	3.7	48.5	0.4	0.1	3.5	43.2	0.6	591
1991	0.0	14.9	50.4	0.3	0.0	16.8	16.5	1.1	357
1992	0.0	2.6	21.7	0.0	0.0	12.4	61.9	1.5	194
1993	0.2	8.8	37.2	0.0	0.9	5.8	46.9	0.2	465
1994	0.2	6.6	49.6	0.4	0.4	12.3	30.5	0.2	547
1995	0.4	9.2	18.4	0.6	0.2	9.4	61.7	0.2	543
1996	0.0	15.3	25.4	0.0	0.0	23.9	34.9	0.5	393
1997	0.0	10.6	55.9	0.0	0.2	6.6	26.6	0.1	640
1998	0.0	9.9	44.5	0.4	0.0	10.1	35.2	0.0	577
1999	0.0	21.4	39.4	0.4	0.1	9.2	29.3	0.2	912
2000	0.0	2.5	72.8	0.0	0.0	2.2	22.4	0.0	357
2001	0.0	15.7	21.0	0.9	0.5	22.7	38.8	0.4	572
2002	0.0	19.1	33.7	0.3	0.1	11.2	35.5	0.1	750
2003	0.4	14.4	51.1	0.0	0.3	13.4	20.3	0.1	1,080
2004	0.0	14.1	31.3	0.2	0.0	16.0	38.0	0.4	489
2005	0.4	13.3	51.6	0.0	0.0	8.7	25.8	0.2	562
2006	0.0	14.3	42.6	0.0	0.0	7.0	36.2	0.0	484
2007	1.1	8.3	64.4	0.2	1.3	3.5	21.2	0.0	458
2008	0.3	17.7	53.4	0.3	2.8	9.9	15.5	0.1	322
2009									
2010	0.2	10.4	37.5	0.2	0.2	15.1	36.4	0.0	451
2011	0.2	7.6	51.4	0.0	0.0	6.9	33.9	0.0	463
2012	1.1	8.4	52.1	0.4	1.1	10.8	25.9	0.4	286
Ave. (1979-11)	0.1	11.2	44.6	0.2	0.2	11.0	32.4	0.2	565

Note: No data collected in 2009.

Table 38.—Historical summary of average lengths and male to female ratios for the major age classes of sockeye salmon sampled from the Crescent River, 1987–2012.

Year	Age Class	Male		Female		Both		Male: Female
		Length (mm)	n	Length (mm)	n	Length (mm)	n	
1987	1.2	507	3	457	2	487	5	1.5:1
1988		470	48	486	29	476	77	1.7:1
1989		475	2	478	3	477	5	0.7:1
1990		547	17	521	7	540	24	2.4:1
1991		517	36	490	17	509	53	2.1:1
1992		473	2	497	3	487	5	0.7:1
1993		484	28	495	13	487	41	2.2:1
1994		458	27	482	9	464	36	3.0:1
1995		485	34	497	16	489	50	2.1:1
1996		477	41	510	19	487	60	2.2:1
1997		463	50	490	18	470	68	2.8:1
1998		473	39	505	18	483	57	2.2:1
1999		468	136	478	59	471	195	2.3:1
2000		464	7	458	2	462	9	3.5:1
2001		462	61	486	29	470	90	2.1:1
2002		471	104	481	39	474	143	2.7:1
2003		474	90	477	65	475	155	1.4:1
2004		460	48	484	21	467	69	2.3:1
2005		457	48	475	27	464	75	1.8:1
2006		475	35	465	34	470	69	1.0:1
2007		464	30	476	8	467	38	3.8:1
2008		444	45	451	12	445	57	3.8:1
2010		480	31	476	16	479	47	1.9:1
2011		458	22	485	13	468	35	1.7:1
2012		429	17	464	7	439	24	2.4:1
Average (1980-11)		474	43	483	22	477	65	2.0:1
1987	1.3	601	54	573	37	589	91	1.5:1
1988		581	195	550	138	567	333	1.4:1
1989		595	174	562	149	580	323	1.2:1
1990		592	184	571	120	584	304	1.5:1
1991		560	105	543	75	553	180	1.4:1
1992		555	24	535	18	546	42	1.3:1
1993		578	81	559	92	568	173	0.9:1
1994		563	124	547	147	554	271	0.8:1
1995		581	40	555	60	565	100	0.7:1
1996		607	50	585	50	596	100	1.0:1
1997		593	164	565	194	578	358	0.8:1
1998		583	114	556	143	568	257	0.8:1
1999		575	164	545	195	558	359	0.8:1
2000		598	99	565	161	578	260	0.6:1
2001		580	45	561	75	568	120	0.6:1
2002		582	103	563	150	571	253	0.7:1
2003		577	235	558	317	566	552	0.7:1
2004		565	72	544	81	554	153	0.9:1
2005		561	109	541	181	548	290	0.6:1
2006		555	85	533	121	542	206	0.7:1
2007		575	118	546	177	557	295	0.7:1
2008		571	76	548	96	558	172	0.8:1
2010		567	76	542	93	554	169	0.8:1
2011		571	135	551	103	563	238	1.3:1
2012		556	68	519	81	536	149	0.8:1
Average (1980-11)		578	112	553	129	565	246	0.9:1

-continued-

Table 38.—Page 2 of 2.

Year	Age Class	Male		Female		Both		Male: Female
		Length (mm)	n	Length (mm)	n	Length (mm)	n	
1987	2.2	489	5	501	3	493	8	1.7:1
1988		487	72	496	60	491	132	1.2:1
1989		526	6	524	8	525	14	0.8:1
1990		519	14	523	6	521	20	2.3:1
1991		515	42	498	18	510	60	2.3:1
1992		486	10	492	14	490	24	0.7:1
1993		479	16	497	11	486	27	1.5:1
1994		466	54	481	13	469	67	4.2:1
1995		503	40	513	11	505	51	3.6:1
1996		497	65	525	29	506	94	2.2:1
1997		473	30	519	12	486	42	2.5:1
1998		497	27	515	31	507	58	0.9:1
1999		474	57	497	27	481	84	2.1:1
2000		452	6	495	2	463	8	3.0:1
2001		481	87	494	43	485	130	2.0:1
2002		492	48	506	36	498	84	1.3:1
2003		498	81	496	64	497	145	1.3:1
2004		480	47	482	31	481	78	1.5:1
2005		491	28	489	21	490	49	1.3:1
2006		472	21	472	13	472	34	1.6:1
2007		444	12	489	4	455	16	3.0:1
2008		476	22	489	10	480	32	2.2:1
2010		498	31	500	37	499	68	0.8:1
2011		504	19	485	13	497	32	1.5:1
2012		458	21	480	10	465	31	2.1:1
Average (1980-11)		490	39	499	27	494	67	1.5:1
1987	2.3	594	49	573	37	585	86	1.3:1
1988		585	110	556	83	572	193	1.3:1
1989		591	222	564	142	580	364	1.6:1
1990		601	165	573	72	593	237	2.3:1
1991		558	36	537	23	550	59	1.6:1
1992		572	58	547	62	559	120	0.9:1
1993		585	104	558	114	571	218	0.9:1
1994		570	86	549	81	560	167	1.1:1
1995		581	154	553	181	566	335	0.9:1
1996		604	66	577	71	590	137	0.9:1
1997		590	84	569	86	579	170	1.0:1
1998		584	85	563	118	572	203	0.7:1
1999		575	138	545	129	561	267	1.1:1
2000		599	20	566	60	574	80	0.3:1
2001		578	91	559	131	567	222	0.7:1
2002		589	108	563	158	574	266	0.7:1
2003		579	96	559	123	568	219	0.8:1
2004		569	84	545	102	556	186	0.8:1
2005		557	61	541	84	548	145	0.7:1
2006		559	81	555	94	556	175	0.9:1
2007		561	44	549	53	554	97	0.8:1
2008		563	21	545	29	553	50	0.7:1
2010		574	65	550	99	559	164	0.7:1
2011		574	74	550	83	561	157	0.9:1
2012		558	45	514	29	541	74	1.6:1
Average (1980-11)		581	95	556	102	568	197	0.9:1
2012 summary (all ages)		521	159	512	127	517	286	1.3:1

Note: Data available to 1981. No data available for 2009.

FIGURES

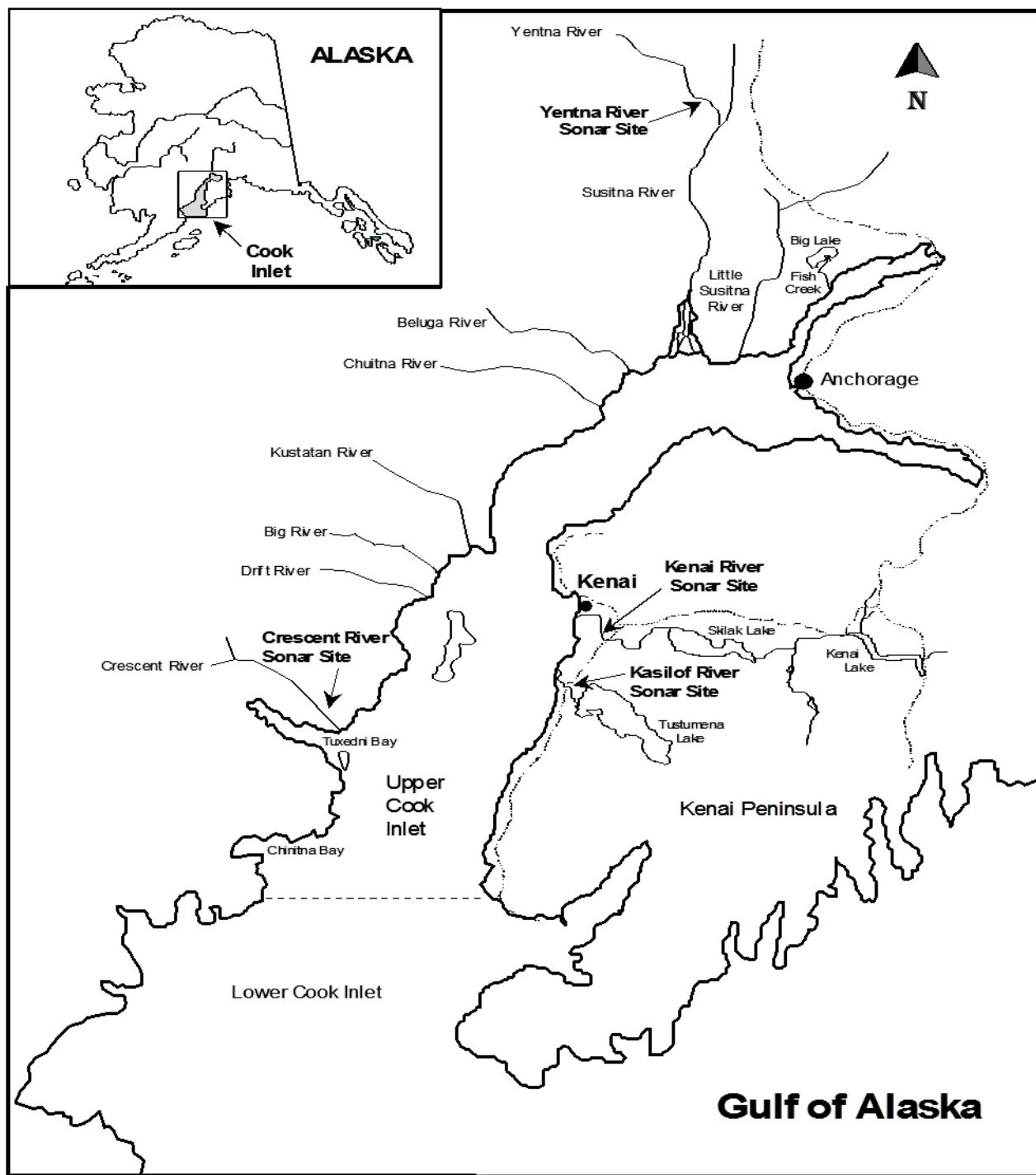


Figure 1.—Map of Upper Cook Inlet, Alaska, showing the locations of the Kenai, Kasilof, Yentna and Crescent rivers escapement projects.

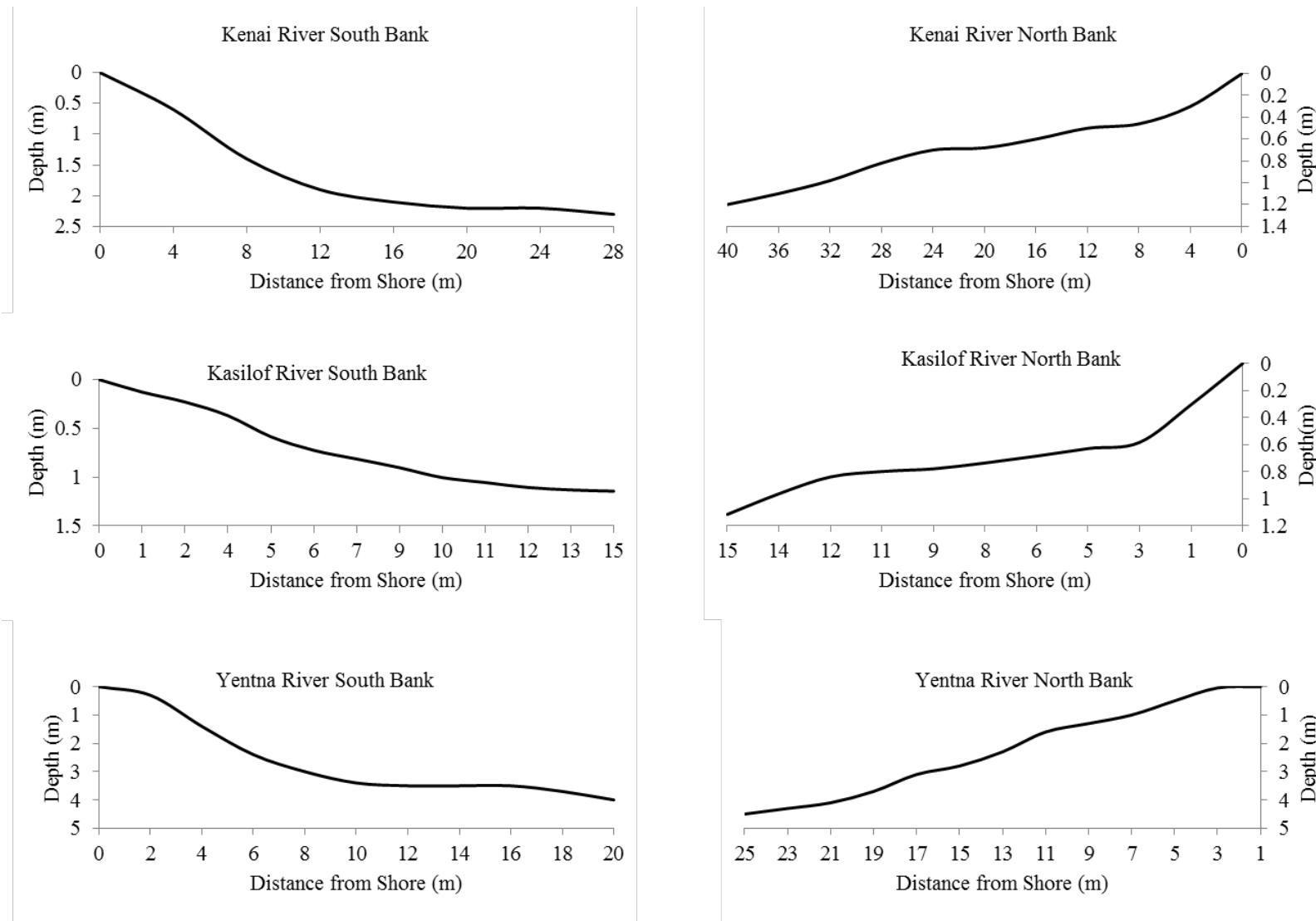


Figure 2.—River bottom profiles of the Kenai (top), Kasilof (middle) and Yentna river (bottom) sonar sites.

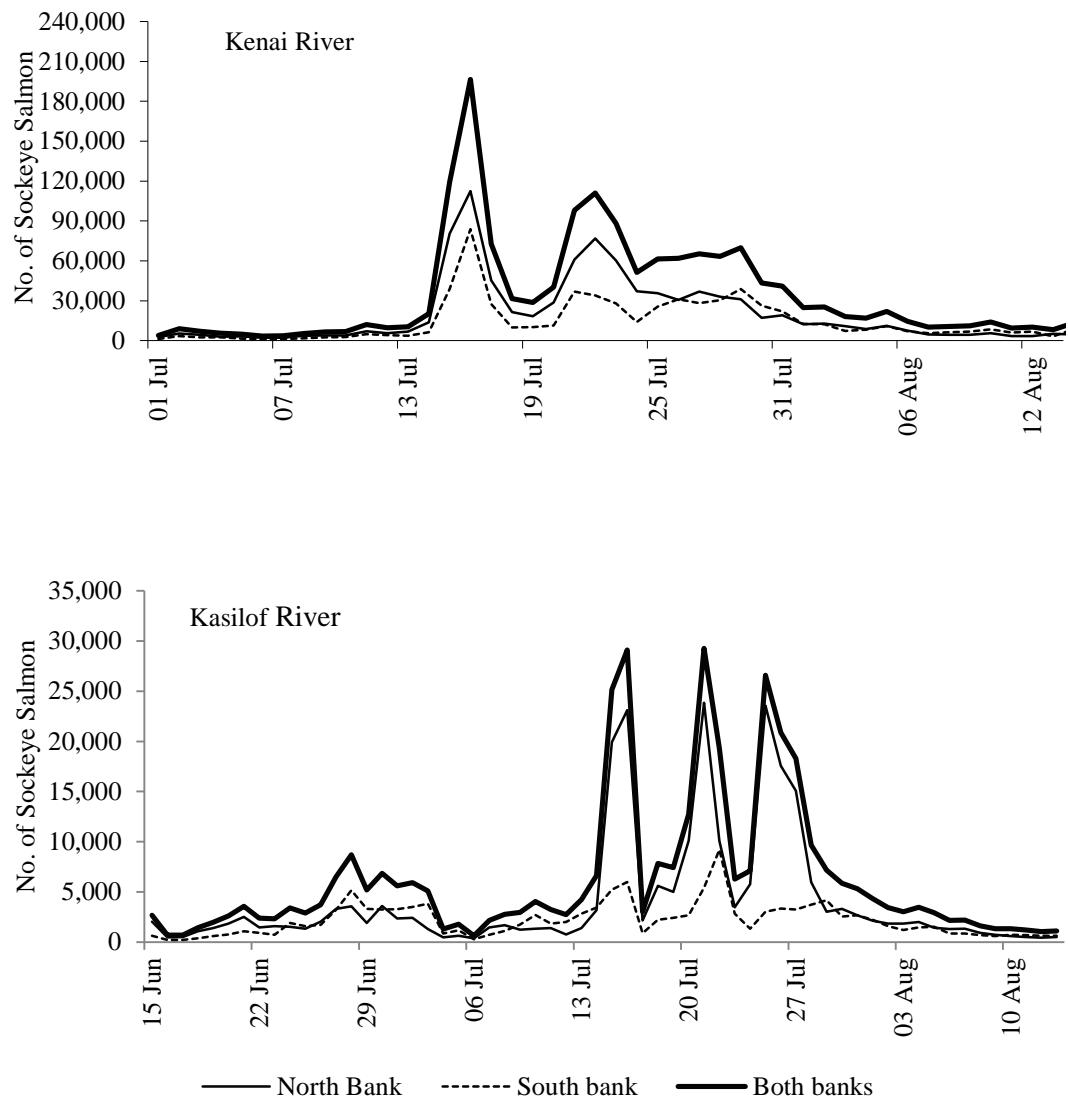
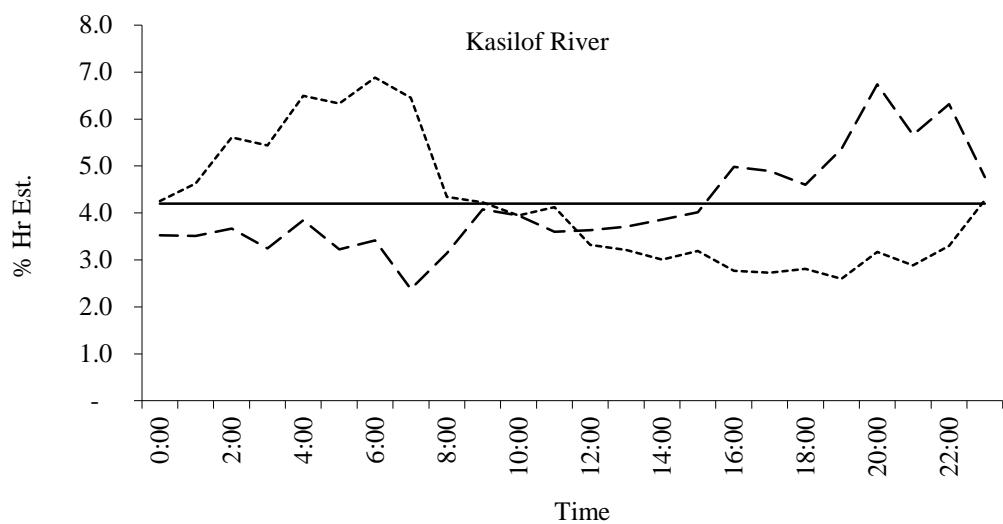
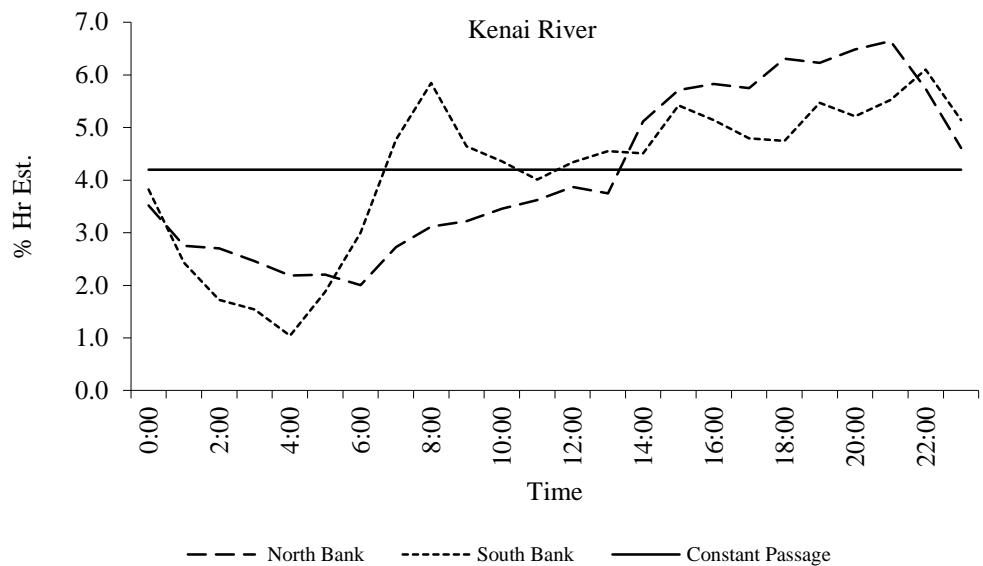
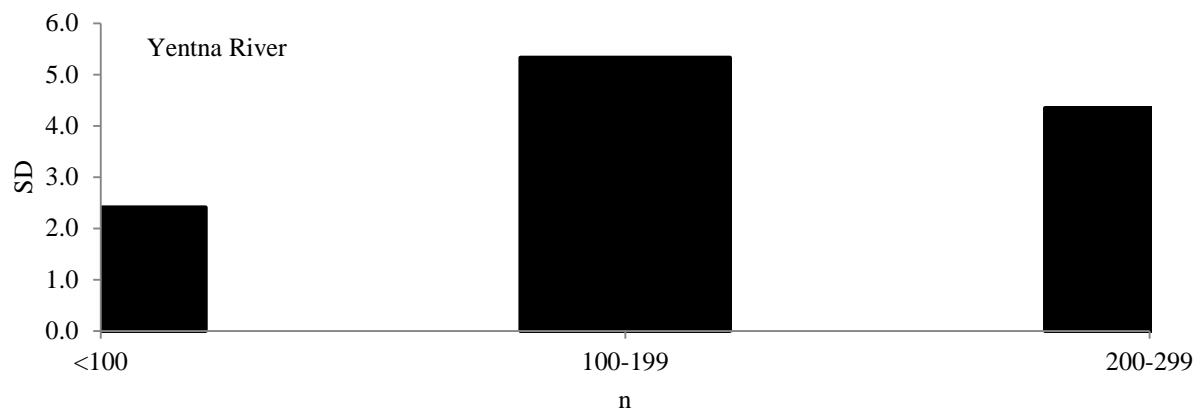
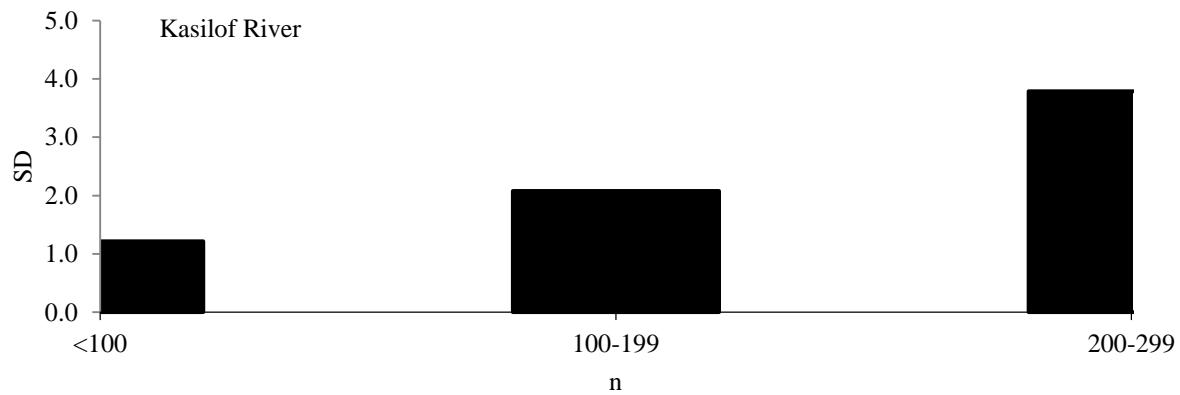
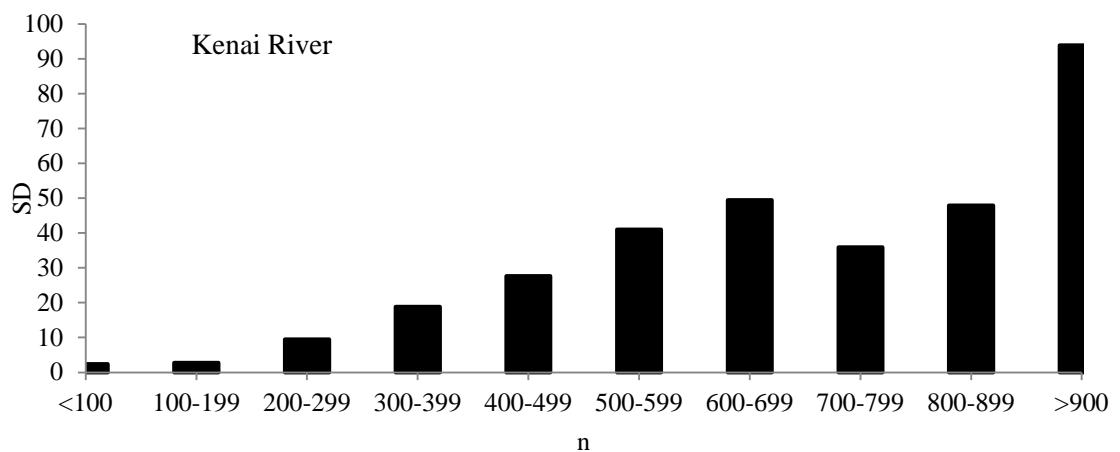


Figure 3.–Total daily escapement estimates by bank for sockeye salmon in the Kenai (top) and Kasilof rivers (bottom), 2012.



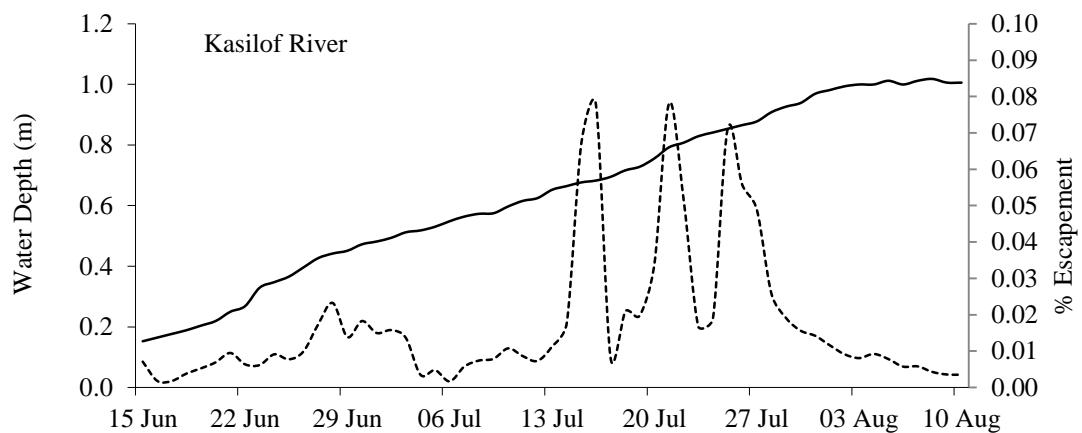
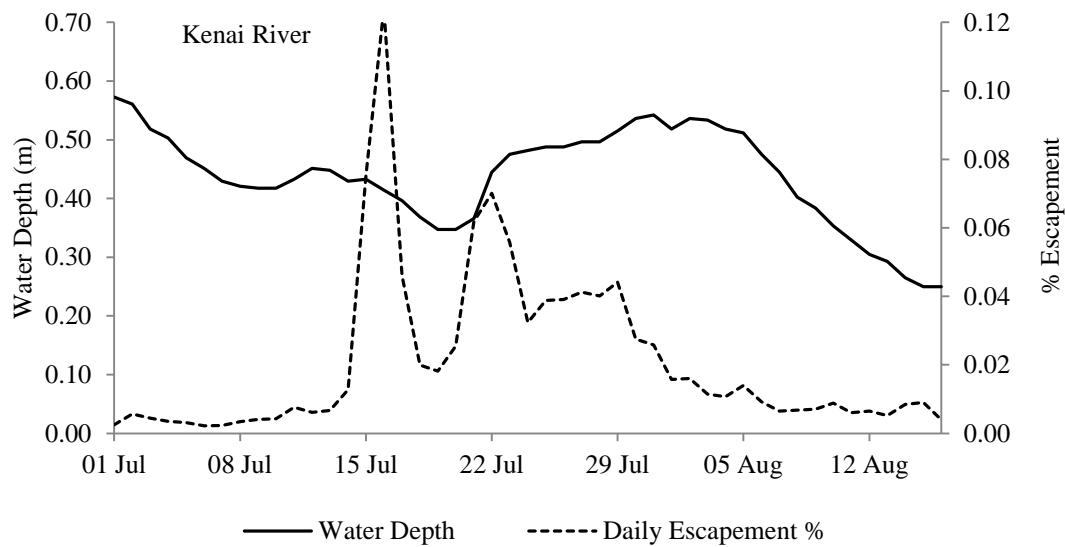
Note: The straight line represents a (hypothetical) constant passage rate over a 24-hour period.

Figure 4.—Mean hourly salmon migration rates by bank in the Kenai (top) and Kasilof (bottom) rivers, 2012.



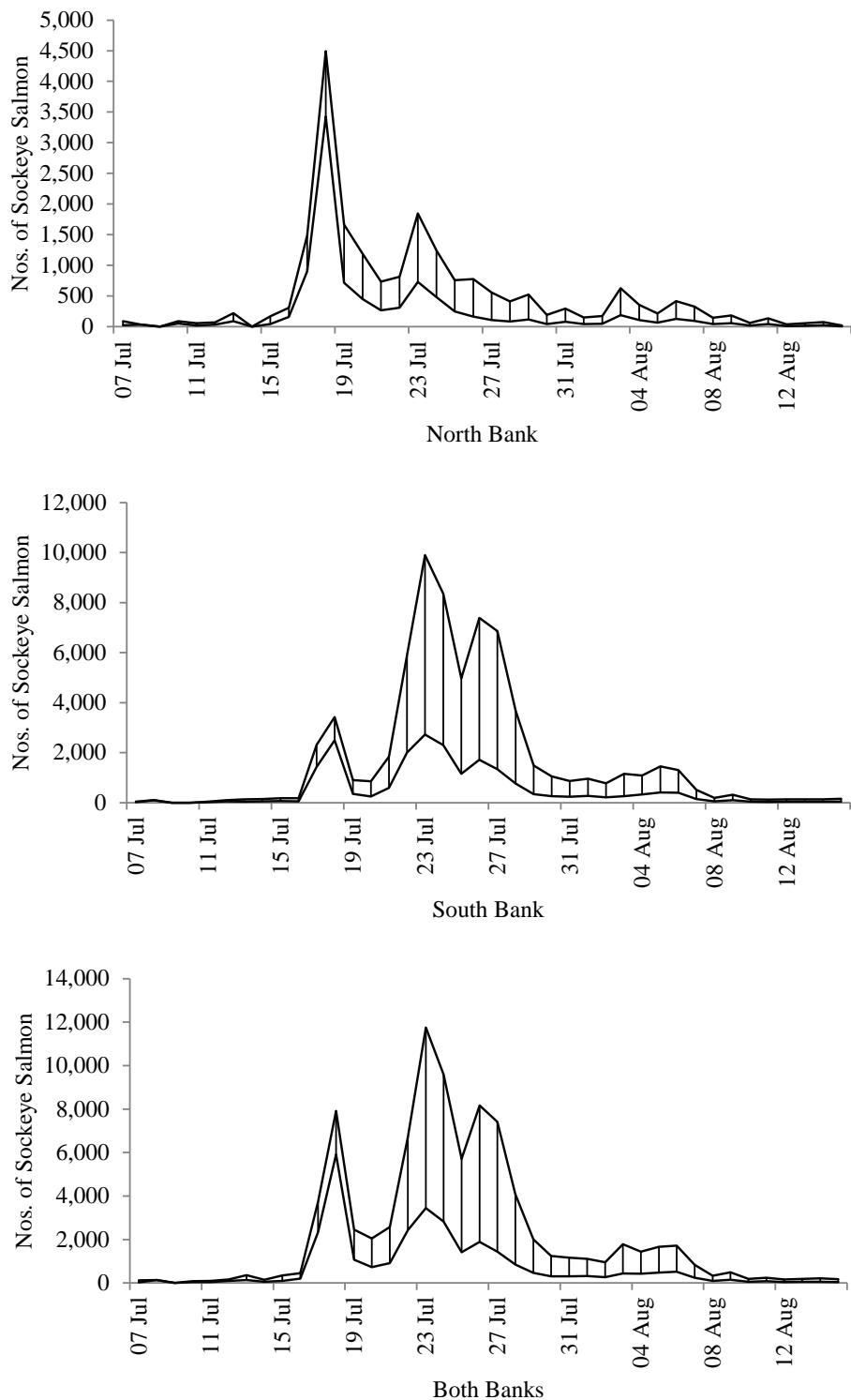
Note: Differences between observers increased with greater fish densities.

Figure 5.—Stratified average standard deviations between individual observer (subsample) counts and average crew counts for Kenai (top), Kasilof (middle) and Yentna (bottom) rivers sonar crews.



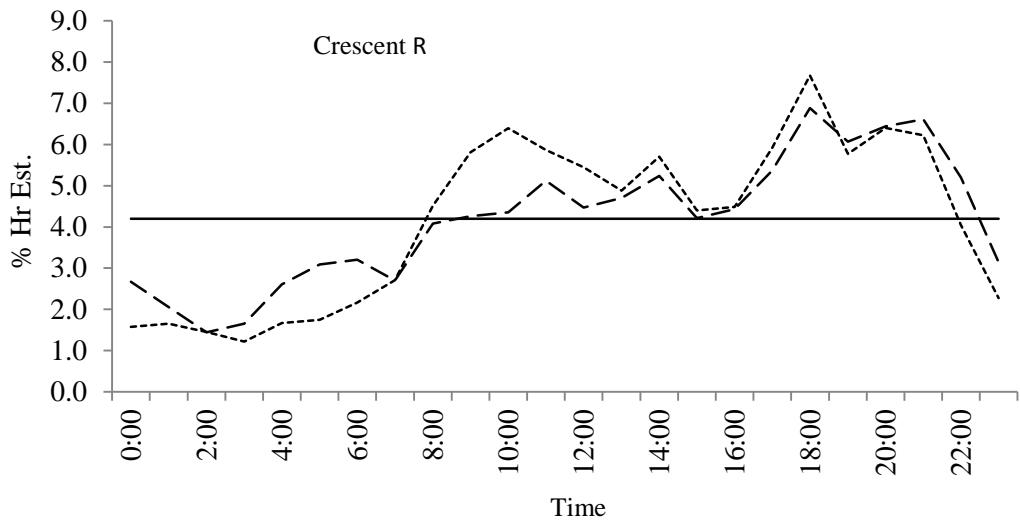
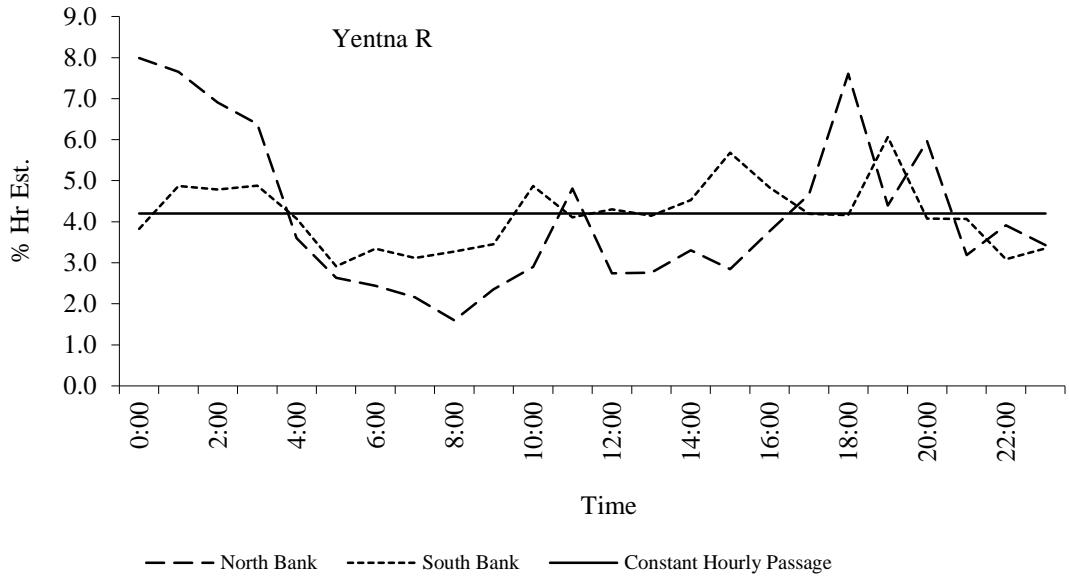
Note: Daily escapement timing for sockeye salmon (dotted line) is included for comparison.

Figure 6.—Daily water level fluctuations (solid line) for the Kenai (top) and Kasilof (bottom) rivers, 2012.



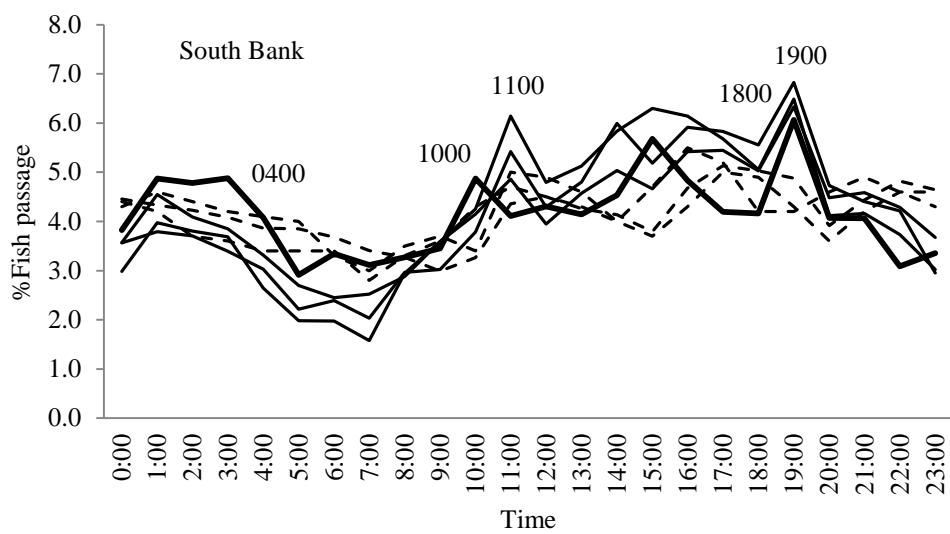
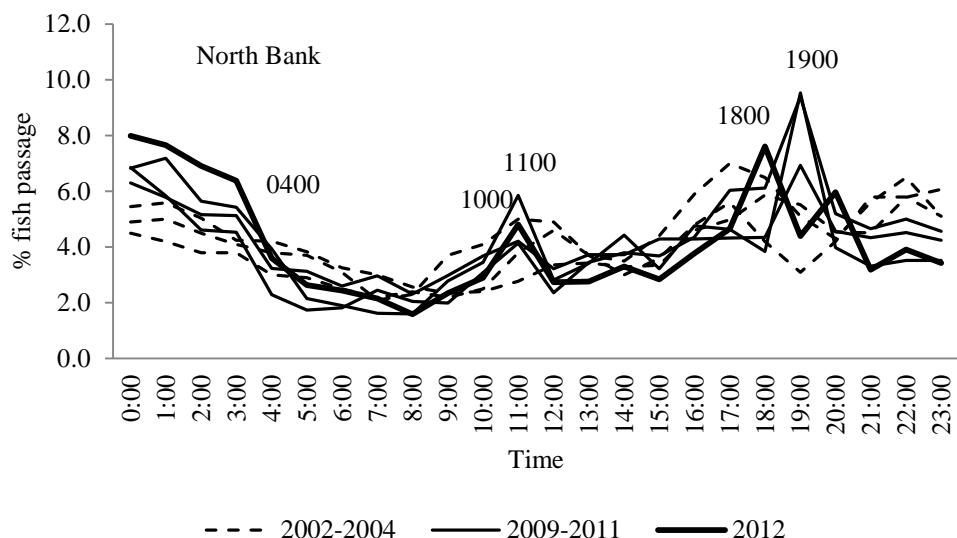
Note: The top line represents a maximum migration estimate and the bottom line represents a minimum.

Figure 7.—Daily ranges in migratory timing of sockeye salmon in the Yentna River, 2012.



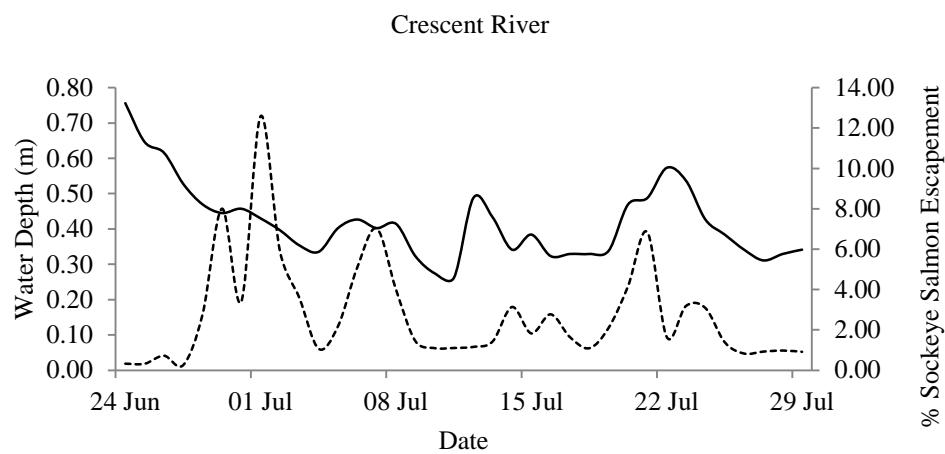
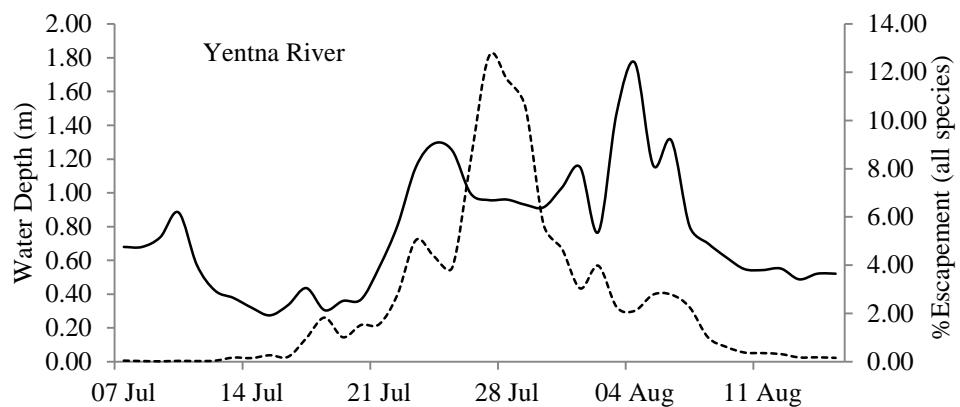
Note: The straight line represents a (hypothetical) constant passage rate for 24 hours.

Figure 8.—Mean hourly salmon passage rates by bank in the Yentna (top) and Crescent (bottom, 2012) rivers.



Note: Includes hourly % fish passages from 2002 to 2004 when fish wheels operated 4 to 6 hours a day compared to fish passages from 2009 to 2012 when they operated 16 to 18 hours a day.

Figure 9.—Charts showing temporary spikes in fish (all species) passage when fish wheels were shut down (~0000–0400, 1000–1100 and 1800–1900) along the north (top) and south (bottom) banks of the Yentna river.



Note: Daily escapement is included for comparison (dotted line).

Figure 10.—Daily water level fluctuations (solid line) for the Yentna (top) and Crescent rivers (bottom), 2012.

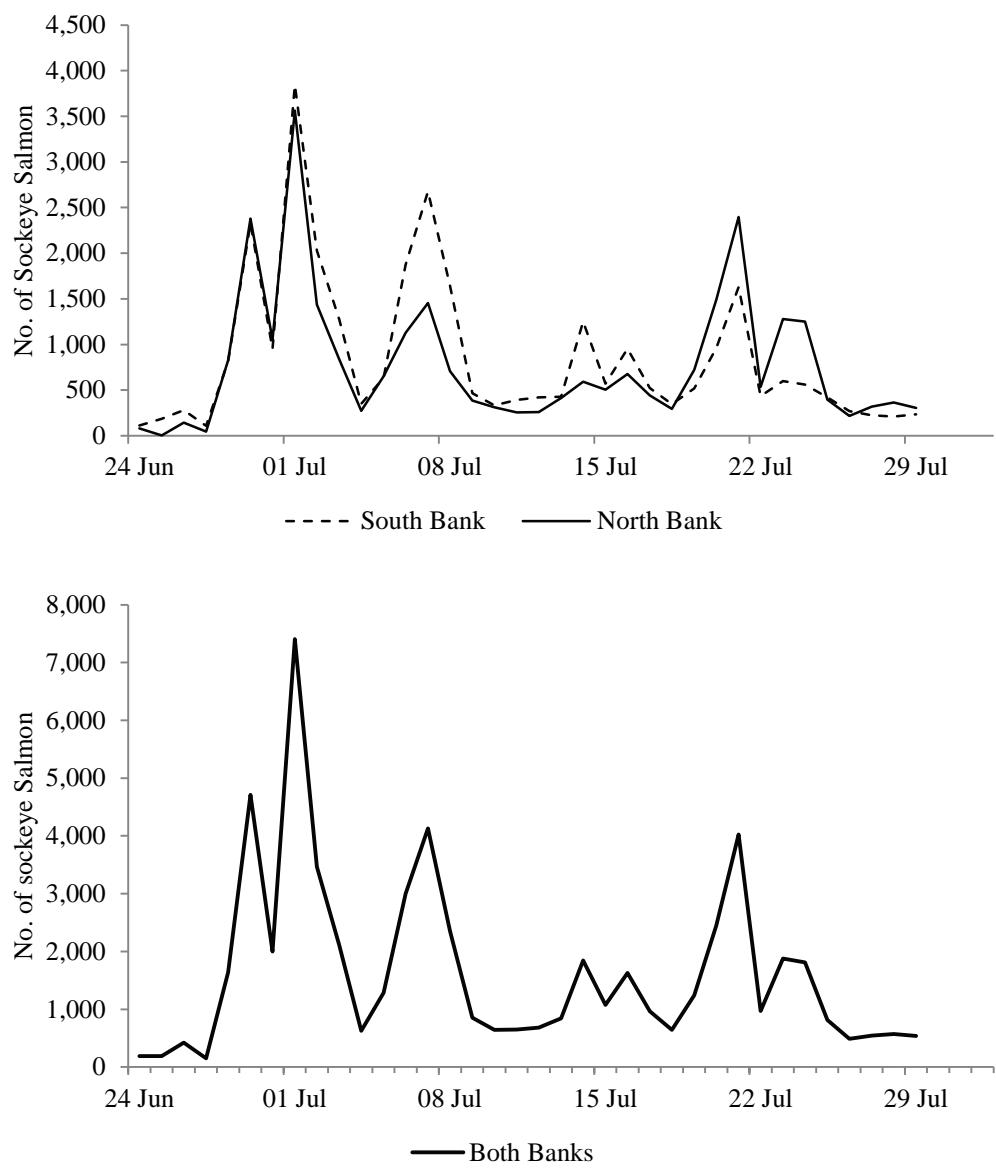


Figure 11.—Daily escapement timing of sockeye salmon by bank (top) and total (bottom) in the Crescent River, 2012.

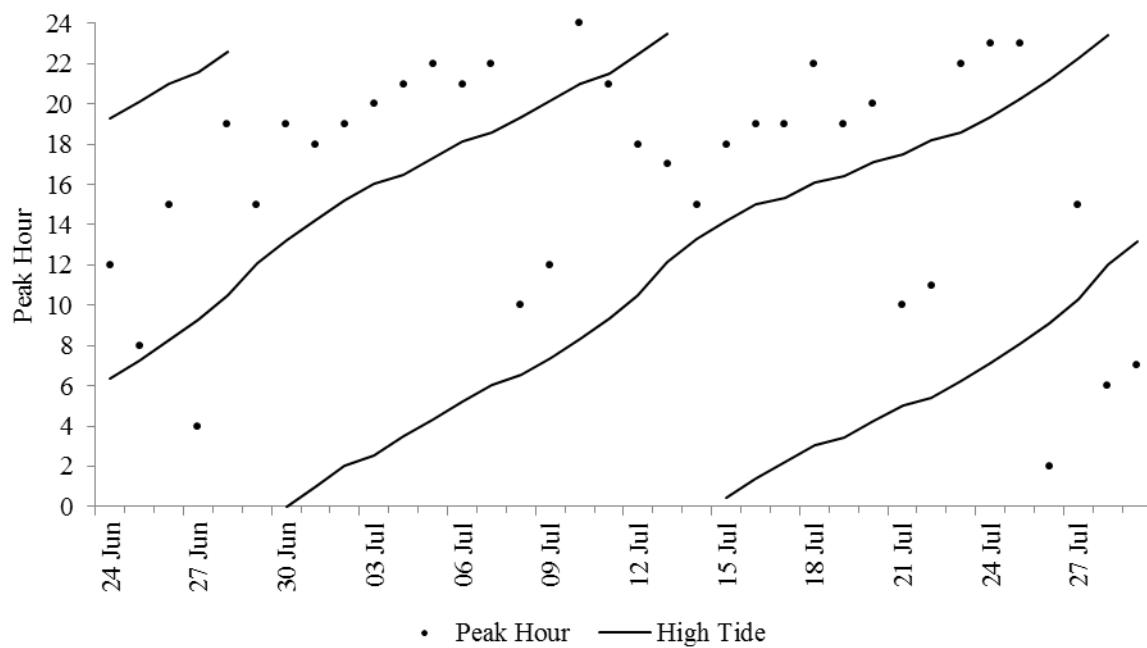


Figure 12.—The timing between peak hourly counts and high tide in the Crescent River, 2012.

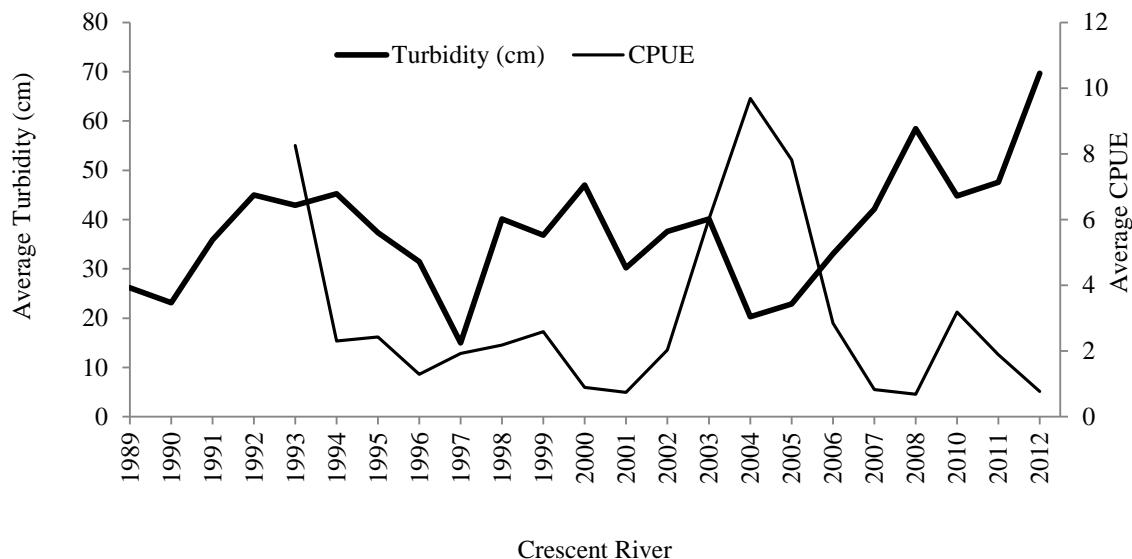
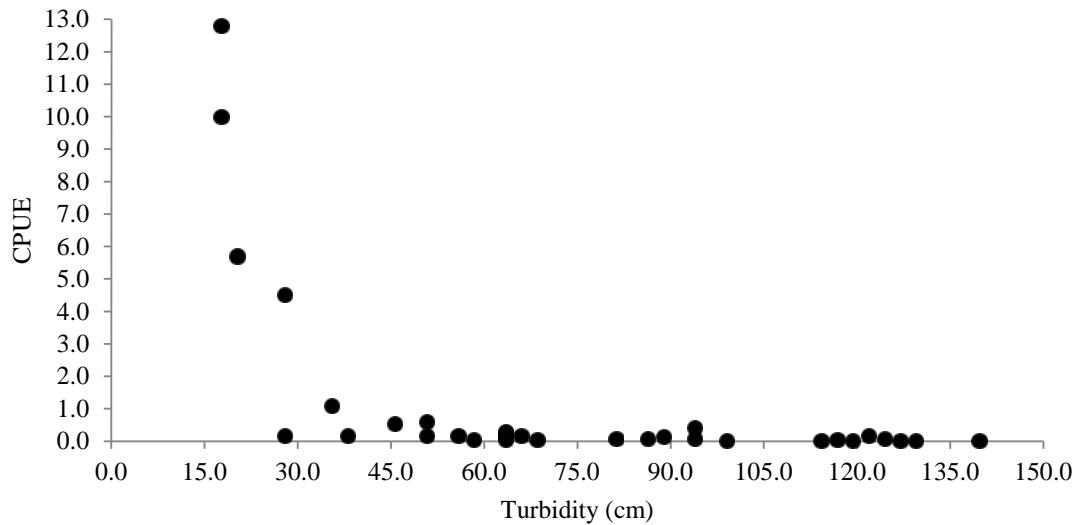


Figure 13.—Daily (top) and historical (bottom) fish wheel CPUE and turbidity measurements of the Crescent River showing effects turbidity has had on fish wheel efficiency (CPUE).

APPENDIX A: KENAI RIVER DATA

Appendix A1.—Salmon escapement estimates (DIDSON) along the north bank of the Kenai River, 2012.

Date	Sockeye		Pink		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
1 Jul	2,710	2,710	0	0	0	0	0	0
2 Jul	5,448	8,158	0	0	0	0	0	0
3 Jul	4,505	12,663	0	0	0	0	0	0
4 Jul	2,910	15,573	0	0	0	0	0	0
5 Jul	3,282	18,855	0	0	0	0	0	0
6 Jul	2,298	21,153	0	0	0	0	0	0
7 Jul	2,328	23,481	0	0	0	0	0	0
8 Jul	3,720	27,201	0	0	0	0	0	0
9 Jul	3,902	31,103	0	0	0	0	0	0
10 Jul	3,954	35,057	0	0	0	0	0	0
11 Jul	7,122	42,179	0	0	0	0	0	0
12 Jul	5,508	47,687	0	0	0	0	0	0
13 Jul	6,906	54,593	0	0	0	0	0	0
14 Jul	13,818	68,411	0	0	0	0	0	0
15 Jul	80,352	148,763	0	0	0	0	0	0
16 Jul	112,530	261,293	0	0	0	0	0	0
17 Jul	45,258	306,551	0	0	0	0	0	0
18 Jul	21,552	328,103	0	0	0	0	0	0
19 Jul	18,450	346,553	0	0	0	0	0	0
20 Jul	28,740	375,293	0	0	0	0	0	0
21 Jul	60,966	436,259	0	0	0	0	0	0
22 Jul	76,878	513,137	0	0	0	0	0	0
23 Jul	60,318	573,455	0	0	0	0	0	0
24 Jul	37,206	610,661	0	0	0	0	0	0
25 Jul	35,715	646,376	0	0	0	0	0	0
26 Jul	30,726	677,102	0	0	0	0	0	0
27 Jul	36,930	714,032	0	0	0	0	0	0
28 Jul	33,072	747,104	0	0	0	0	0	0
29 Jul	31,134	778,238	0	0	0	0	0	0
30 Jul	17,196	795,434	0	0	0	0	0	0
31 Jul	18,996	814,430	0	0	0	0	0	0
1 Aug	12,306	826,736	0	0	0	0	0	0
2 Aug	12,948	839,684	0	0	0	0	0	0
3 Aug	10,842	850,526	0	0	0	0	0	0
4 Aug	8,646	859,172	0	0	0	0	0	0
5 Aug	11,088	870,260	0	0	0	0	0	0
6 Aug	7,506	877,766	0	0	0	0	0	0
7 Aug	4,764	882,530	0	0	0	0	0	0
8 Aug	4,302	886,832	0	0	0	0	0	0
9 Aug	4,320	891,152	0	0	0	0	0	0
10 Aug	5,526	896,678	0	0	0	0	0	0
11 Aug	3,552	900,230	196	196	0	0	98	98
12 Aug	3,438	903,668	737	932	61	61	0	98
13 Aug	3,125	906,793	965	1,897	138	199	230	328
14 Aug	4644	911,437	885	2,782	0	199	147	475
15 Aug	5,477	916,914	2,191	4,973	129	328	387	862
16 Aug	1,783	918,697	3,268	8,241	1,486	1,814	891	1,753

Appendix A2.—Salmon escapement estimates (DIDSON) along the south bank of the Kenai River, 2012.

Date	Sockeye		Pink		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
1 Jul	1,260	1,260	0	0	0	0	0	0
2 Jul	3,522	4,782	0	0	0	0	0	0
3 Jul	2,562	7,344	0	0	0	0	0	0
4 Jul	2,604	9,948	0	0	0	0	0	0
5 Jul	1,631	11,579	0	0	0	0	0	0
6 Jul	1,128	12,707	0	0	0	0	0	0
7 Jul	1,320	14,027	0	0	0	0	0	0
8 Jul	1,746	15,773	0	0	0	0	0	0
9 Jul	2,568	18,341	0	0	0	0	0	0
10 Jul	2,820	21,161	0	0	0	0	0	0
11 Jul	4,932	26,093	0	0	0	0	0	0
12 Jul	4,218	30,311	0	0	0	0	0	0
13 Jul	3,642	33,953	0	0	0	0	0	0
14 Jul	6,396	40,349	0	0	0	0	0	0
15 Jul	38,922	79,271	0	0	0	0	0	0
16 Jul	83,826	163,097	0	0	0	0	0	0
17 Jul	27,468	190,565	0	0	0	0	0	0
18 Jul	10,054	200,619	0	0	0	0	0	0
19 Jul	10,272	210,891	0	0	0	0	0	0
20 Jul	11,490	222,381	0	0	0	0	0	0
21 Jul	36,948	259,329	0	0	0	0	0	0
22 Jul	34,020	293,349	0	0	0	0	0	0
23 Jul	27,937	321,286	0	0	0	0	0	0
24 Jul	14,016	335,302	0	0	0	0	0	0
25 Jul	25,705	361,007	0	0	0	0	0	0
26 Jul	31,086	392,093	0	0	0	0	0	0
27 Jul	28,320	420,413	0	0	0	0	0	0
28 Jul	30,366	450,779	0	0	0	0	0	0
29 Jul	38,736	489,515	0	0	0	0	0	0
30 Jul	26,298	515,813	0	0	0	0	0	0
31 Jul	21,924	537,737	0	0	0	0	0	0
1 Aug	12,570	550,307	0	0	0	0	0	0
2 Aug	12,336	562,643	0	0	0	0	0	0
3 Aug	7,260	569,903	0	0	0	0	0	0
4 Aug	8,262	578,165	0	0	0	0	0	0
5 Aug	10,992	589,157	0	0	0	0	0	0
6 Aug	7,098	596,255	0	0	0	0	0	0
7 Aug	5,514	601,769	0	0	0	0	0	0
8 Aug	6,462	608,231	0	0	0	0	0	0
9 Aug	6,798	615,029	0	0	0	0	0	0
10 Aug	8,442	623,471	0	0	0	0	0	0
11 Aug	6,008	629,479	331	331	0	0	165	165
12 Aug	6,871	636,350	1,472	1,803	123	123	0	165
13 Aug	5,148	641,498	1,590	3,393	227	350	379	544
14 Aug	8,694	650,192	1,656	5,049	0	350	276	820
15 Aug	8,232	658,424	3,293	8,342	194	544	581	1,401
16 Aug	4,434	662,858	8,129	16,471	3,695	4,239	2,217	3,618

Appendix A3.—Kenai River north bank DIDSON estimates (all species) by day and hour, 2012.

Date	Estimates by Hour											
	1	2	3	4	5	6	7	8	9	10	11	12
1 Jul	198	66	54	198	90	36	0	42	90	108	125	121
2 Jul	306	288	264	168	126	186	174	390	240	156	444	480
3 Jul	240	84	72	60	96	84	210	246	228	366	174	186
4 Jul	120	18	66	78	60	30	114	90	96	84	264	186
5 Jul	444	90	72	54	78	156	78	186	162	72	108	150
6 Jul	210	66	54	30	54	96	24	108	60	180	150	156
7 Jul	78	12	6	18	12	60	90	72	180	78	258	72
8 Jul	156	42	48	30	30	108	96	366	312	150	342	246
9 Jul	108	126	96	192	186	276	156	522	138	144	144	138
10 Jul	42	48	66	90	102	330	438	336	174	126	66	102
11 Jul	156	96	126	96	60	150	228	318	54	138	204	642
12 Jul	162	0	48	24	12	156	132	156	276	300	288	60
13 Jul	318	72	66	12	42	126	36	36	312	342	252	432
14 Jul	204	138	42	42	60	264	162	402	318	234	516	942
15 Jul	270	1,020	1,008	1,116	1,248	162	744	1,980	1,800	2,142	2,142	3,330
16 Jul	2,520	2,646	2,328	3,198	3,414	4,128	2,286	2,448	2,826	4,302	5,058	6,396
17 Jul	1,254	372	2,208	2,580	1,536	1,344	1,380	3,654	4,692	2,382	1,968	1,470
18 Jul	750	276	312	228	282	282	414	732	912	444	222	366
19 Jul	450	312	402	240	288	126	342	198	138	192	270	222
20 Jul	348	258	354	336	450	342	330	612	474	426	486	468
21 Jul	738	606	678	894	1,608	456	354	510	876	1,404	2,628	2,556
22 Jul	2,094	2,256	1,368	1,176	1,368	2,070	2,184	2,118	2,298	1,992	3,300	3,264
23 Jul	2,958	1,950	2,124	702	1,662	552	1,176	1,152	1,656	2,742	3,180	2,238
24 Jul	1,524	1,548	1,356	1,554	1,458	1,140	600	852	1,092	696	1,140	1,812
25 Jul	1,698	1,050	720	804	756	732	678	870	504	228	624	672
26 Jul	2,388	846	888	1,008	432	408	588	462	312	1,002	600	1,080
27 Jul	2,208	1,098	1,188	1,134	306	990	660	462	1,044	780	552	780
28 Jul	1,836	1,908	1,362	444	186	1,182	972	1,104	1,680	1,236	642	372
29 Jul	2,448	1,326	1,656	1,374	516	462	570	750	774	1,722	1,044	1,278
30 Jul	708	1,296	606	312	444	510	570	834	786	660	480	258
31 Jul	240	516	486	150	72	378	264	546	510	432	588	408

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Date	Estimates by Hour												Daily Total
	13	14	15	16	17	18	19	20	21	22	23	24	
1 Jul	121	121	134	108	216	150	216	72	114	90	156	84	2,710
2 Jul	84	210	276	102	120	102	450	240	186	240	114	102	5,448
3 Jul	408	282	150	186	200	167	173	180	150	174	240	150	4,505
4 Jul	276	204	6	114	114	42	60	144	120	294	156	174	2,910
5 Jul	138	144	168	66	90	54	108	132	228	216	210	78	3,282
6 Jul	66	204	174	108	54	6	78	102	36	72	48	162	2,298
7 Jul	180	144	168	204	156	132	48	54	72	30	96	108	2,328
8 Jul	180	108	138	126	78	408	180	150	102	108	126	90	3,720
9 Jul	180	114	152	78	66	156	210	348	72	72	168	60	3,902
10 Jul	306	120	66	42	48	72	72	216	234	552	132	174	3,954
11 Jul	426	216	576	480	714	168	558	546	294	180	288	408	7,122
12 Jul	186	258	324	216	336	114	282	348	270	264	600	696	5,508
13 Jul	498	216	426	270	456	438	330	288	288	234	582	834	6,906
14 Jul	534	594	1,548	1,056	1,248	1,278	954	1,080	600	318	720	564	13,818
15 Jul	3,066	3,474	4,230	6,132	4,536	5,748	7,182	7,344	7,128	6,354	5,112	3,084	80,352
16 Jul	5,148	6,168	6,732	4,182	8,514	5,958	6,180	6,258	8,934	6,642	4,098	2,166	112,530
17 Jul	1,794	1,392	3,552	2,160	2,016	2,250	1,662	1,464	984	1,554	1,218	372	45,258
18 Jul	792	564	2,064	2,136	1,494	1,194	1,314	1,374	1,278	1,632	1,710	780	21,552
19 Jul	276	408	1,476	1,488	1,218	1,494	2,142	1,542	2,136	1,452	906	732	18,450
20 Jul	474	2,472	2,508	2,028	1,482	1,710	2,202	2,760	2,796	2,712	1,782	930	28,740
21 Jul	2,664	1,782	2,310	3,846	3,576	3,702	3,228	3,468	5,706	6,294	5,952	5,130	60,966
22 Jul	3,780	2,484	3,096	6,114	5,064	5,058	4,320	3,816	3,492	4,620	4,746	4,800	76,878
23 Jul	2,364	2,286	1,968	3,750	4,422	4,308	4,608	3,108	2,862	3,684	2,622	2,244	60,318
24 Jul	2,064	1,458	1,326	1,326	2,184	3,120	2,700	2,022	1,920	1,572	1,188	1,554	37,206
25 Jul	1,368	900	1,085	1,265	1,158	2,070	3,414	4,092	3,072	3,270	2,946	1,740	35,715
26 Jul	1,002	1,440	1,920	2,676	1,530	1,548	2,022	2,178	2,040	1,584	1,122	1,650	30,726
27 Jul	582	1,410	1,296	1,440	2,844	2,646	2,742	2,262	1,572	3,408	2,868	2,658	36,930
28 Jul	1,374	1,056	1,524	1,128	1,794	1,200	1,800	1,554	3,084	1,812	1,950	1,872	33,072
29 Jul	1,986	1,614	1,890	2,496	1,368	1,620	2,040	1,386	612	1,182	654	366	31,134
30 Jul	660	378	930	822	690	1,266	744	612	1,200	684	888	858	17,196
31 Jul	300	498	1,530	2,754	1,554	678	1,020	846	1,434	1,518	1,518	756	18,996

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Date	Estimates by Hour											
	1	2	3	4	5	6	7	8	9	10	11	12
1 Aug	258	414	258	516	234	258	486	222	240	546	432	312
2 Aug	210	414	642	432	318	270	288	120	828	312	504	444
3 Aug	624	480	528	216	138	150	102	102	468	654	96	90
4 Aug	516	372	336	336	420	180	162	78	282	432	252	234
5 Aug	192	174	198	138	72	150	162	102	282	180	468	300
6 Aug	450	210	300	378	168	336	264	222	420	486	294	132
7 Aug	234	156	138	108	108	132	192	192	150	216	150	222
8 Aug	342	366	204	282	240	138	186	162	132	198	222	102
9 Aug	678	450	378	444	324	228	48	132	186	132	210	30
10 Aug	282	378	492	516	264	264	198	222	66	204	258	138
11 Aug	294	234	264	312	216	288	84	192	60	270	180	132
12 Aug	210	228	378	192	132	150	84	246	198	270	276	150
13 Aug	372	456	234	210	168	210	78	258	138	204	90	54
14 Aug	270	288	168	168	246	198	132	162	126	168	78	180
15 Aug	354	282	300	138	150	114	78	150	156	168	246	96
16 Aug	270	294	204	174	132	126	60	264	258	276	150	162
Total	32,730	25,626	25,146	22,902	20,364	20,514	18,654	25,380	29,004	29,976	32,165	33,661
%	3.5	2.8	2.7	2.5	2.2	2.2	2.0	2.7	3.1	3.2	3.5	3.6
Cum	3.5	6.3	9.0	11.4	13.6	15.8	17.8	20.6	23.7	26.9	30.4	34.0

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Date	Estimates by Hour												Daily Total
	13	14	15	16	17	18	19	20	21	22	23	24	
1 Aug	426	402	768	180	636	384	978	1,056	648	918	1,386	348	12,306
2 Aug	192	120	378	1,188	816	630	894	876	438	1,026	936	672	12,948
3 Aug	126	204	252	576	984	666	540	1,200	918	564	306	858	10,842
4 Aug	168	78	390	462	480	396	354	1,026	660	450	252	330	8,646
5 Aug	576	354	510	612	408	696	744	984	1,398	1,086	570	732	11,088
6 Aug	162	198	216	174	306	210	324	312	294	846	426	378	7,506
7 Aug	192	66	318	156	222	138	318	294	210	270	378	204	4,764
8 Aug	78	48	78	60	78	96	102	138	210	258	180	402	4,302
9 Aug	114	78	48	24	48	42	36	66	54	114	150	306	4,320
10 Aug	150	96	60	48	84	132	318	282	228	258	282	306	5,526
11 Aug	42	30	30	42	102	47	18	60	96	192	264	396	3,845
12 Aug	60	54	66	72	30	72	60	84	126	204	348	546	4,236
13 Aug	36	30	6	66	12	54	54	138	156	354	552	528	4,458
14 Aug	66	60	144	132	180	168	204	342	402	606	726	462	5,676
15 Aug	198	96	288	258	420	648	336	576	984	894	618	636	8,184
16 Aug	126	270	306	186	60	264	390	522	516	936	1,062	420	7,428
	35,989	34,903	47,601	53,135	54,206	53,500	58,709	57,942	60,354	61,794	53,352	42,900	930,505
	3.9	3.8	5.1	5.7	5.8	5.7	6.3	6.2	6.5	6.6	5.7	4.6	
	37.8	41.6	46.7	52.4	58.2	64.0	70.3	76.5	83.0	89.7	95.4	100.0	

Appendix A4.—Kenai River south bank DIDSON estimates (all species) by day and hour, 2012.

Date	Estimates by Hour											
	1	2	3	4	5	6	7	8	9	10	11	12
1 Jul	18	24	36	24	12	0	30	18	60	72	84	60
2 Jul	108	36	144	78	36	54	102	12	18	114	384	582
3 Jul	102	252	54	66	24	60	30	18	36	42	144	264
4 Jul	168	108	48	48	78	42	78	66	102	174	336	270
5 Jul	192	114	54	36	24	18	18	30	24	54	48	101
6 Jul	54	96	12	12	30	18	36	24	48	54	18	12
7 Jul	24	18	6	0	6	0	18	18	42	78	60	60
8 Jul	18	6	36	0	156	24	78	66	42	66	108	42
9 Jul	18	72	30	48	42	108	36	42	174	102	324	240
10 Jul	84	12	78	24	18	42	54	36	78	78	234	330
11 Jul	12	42	18	78	42	42	54	24	72	132	438	486
12 Jul	48	48	18	12	0	24	12	132	168	312	150	210
13 Jul	168	216	72	54	18	78	78	72	144	126	462	270
14 Jul	252	336	72	24	60	120	162	324	624	336	552	336
15 Jul	612	750	396	384	264	246	702	2,160	1,044	930	2,514	1,284
16 Jul	3,786	2,904	3,048	2,166	1,014	2,712	2,946	5,706	6,402	6,168	4,224	3,942
17 Jul	2,736	1,926	1,368	1,356	132	1,104	1,122	2,772	2,934	918	1,230	1,272
18 Jul	216	138	259	280	280	280	246	288	396	342	294	234
19 Jul	318	114	90	66	132	174	204	216	408	408	402	480
20 Jul	444	180	72	144	192	192	528	540	546	432	210	666
21 Jul	228	78	24	66	126	828	1,362	1,782	1,926	2,004	1,470	1,650
22 Jul	1,770	1,476	678	156	684	816	810	2,124	4,020	3,780	1,968	1,518
23 Jul	858	690	192	210	162	444	1,320	1,350	2,748	2,106	828	1,153
24 Jul	1,098	450	84	234	186	774	816	498	720	492	594	390
25 Jul	324	168	54	66	96	828	1,566	1,650	1,776	540	1,215	1,158
26 Jul	360	216	90	156	126	444	1,350	948	2,034	1,242	1,116	1,680
27 Jul	384	534	366	156	36	588	750	1,026	1,704	918	996	474
28 Jul	2,418	588	186	330	246	486	1,212	2,310	2,214	1,596	1,146	1,476
29 Jul	2,292	396	426	474	72	174	720	2,460	2,274	2,358	1,506	1,512
30 Jul	738	912	354	348	228	300	714	1,224	1,848	1,146	1,614	1,080
31 Jul	540	60	120	54	30	102	276	846	768	378	480	360

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Date	Estimates by Hour												Daily Total
	13	14	15	16	17	18	19	20	21	22	23	24	
1 Jul	42	36	24	150	60	150	90	60	72	48	42	48	1,260
2 Jul	474	120	48	204	90	138	162	216	54	126	174	48	3,522
3 Jul	234	132	96	18	54	60	12	132	144	84	300	204	2,562
4 Jul	66	180	120	24	18	96	54	30	36	318	114	30	2,604
5 Jul	186	156	138	36	48	48	78	60	30	72	36	30	1,631
6 Jul	54	144	78	24	30	30	48	6	78	54	114	54	1,128
7 Jul	90	36	84	192	108	66	60	36	66	54	138	60	1,320
8 Jul	150	90	54	60	144	138	216	72	30	36	84	30	1,746
9 Jul	90	192	102	42	24	96	240	96	204	156	54	36	2,568
10 Jul	252	96	162	108	120	84	270	144	192	66	162	96	2,820
11 Jul	150	738	360	288	132	42	90	282	156	504	678	72	4,932
12 Jul	330	456	342	330	204	276	204	360	138	180	180	84	4,218
13 Jul	348	276	264	312	102	102	48	78	102	42	138	72	3,642
14 Jul	318	354	222	408	360	288	234	378	156	78	198	204	6,396
15 Jul	936	1,254	1,290	972	1,764	2,544	2,172	3,204	1,620	1,698	3,930	6,252	38,922
16 Jul	5,484	4,824	4,146	5,052	3,648	2,298	1,728	2,910	2,304	1,638	2,058	2,718	83,826
17 Jul	1,032	1,380	1,044	1,050	798	498	648	798	378	216	348	408	27,468
18 Jul	225	444	732	636	582	456	636	672	750	372	600	696	10,054
19 Jul	198	570	696	492	516	654	786	714	606	732	786	510	10,272
20 Jul	474	876	450	636	726	744	558	354	564	744	672	546	11,490
21 Jul	1,158	1,104	942	2,016	1,968	1,380	2,694	2,118	2,046	4,116	2,982	2,880	36,948
22 Jul	1,584	864	1,650	2,466	1,584	1,110	1,800	360	678	888	900	336	34,020
23 Jul	1,134	516	822	1,602	1,590	2,130	1,410	1,494	858	1,692	1,134	1,494	27,937
24 Jul	498	372	822	324	672	954	738	1,206	306	468	642	678	14,016
25 Jul	1,116	1,050	948	886	714	1,128	960	2,484	2,850	2,028	1,548	552	25,705
26 Jul	1,260	2,004	1,602	1,578	1,194	834	738	1,008	1,854	2,634	4,356	2,262	31,086
27 Jul	1,014	1,932	1,764	1,338	1,290	1,494	984	1,524	1,380	1,812	2,688	3,168	28,320
28 Jul	1,308	1,110	1,518	1,710	1,314	1,110	1,146	1,158	1,146	1,698	2,106	834	30,366
29 Jul	2,556	2,784	1,884	2,562	2,736	2,412	1,668	1,620	1,818	1,740	1,002	1,290	38,736
30 Jul	1,308	1,410	1,248	1,542	1,308	984	1,026	1,632	2,202	1,182	1,530	420	26,298
31 Jul	378	888	1,428	2,022	1,878	1,446	1,380	2,124	1,704	1,608	1,854	1,200	21,924

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Date	Estimates by Hour											
	1	2	3	4	5	6	7	8	9	10	11	12
1 Aug	438	252	66	48	48	78	456	264	618	336	1,038	504
2 Aug	510	216	102	168	30	90	168	174	582	312	186	384
3 Aug	330	150	126	90	24	66	96	54	228	132	270	144
4 Aug	348	228	84	132	156	78	222	264	450	456	420	354
5 Aug	108	24	60	36	30	60	228	276	648	606	372	300
6 Aug	168	66	72	90	54	66	276	504	516	156	210	204
7 Aug	138	216	210	204	144	72	78	108	126	288	168	264
8 Aug	408	258	318	252	150	150	156	258	138	114	300	300
9 Aug	576	204	240	258	252	162	192	144	180	168	132	204
10 Aug	768	324	408	360	360	132	204	180	102	210	324	312
11 Aug	270	384	306	390	330	156	264	216	78	270	162	114
12 Aug	288	240	240	402	276	120	270	510	282	306	204	114
13 Aug	312	240	132	192	264	90	96	276	168	186	234	168
14 Aug	234	264	324	288	156	210	96	240	168	162	192	204
15 Aug	456	366	426	396	228	126	174	234	300	294	228	132
16 Aug	522	294	252	150	126	108	208	279	189	387	342	258
Total	26,262	16,686	11,851	10,606	7,180	12,886	20,614	32,763	40,167	31,881	29,931	27,552
%	3.8	2.4	1.7	1.5	1.0	1.9	3.0	4.8	5.8	4.6	4.4	4.0
Cum	3.8	6.2	8.0	9.5	10.6	12.4	15.4	20.2	26.1	30.7	35.0	39.1

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Date	Estimates by Hour												Daily Total
	13	14	15	16	17	18	19	20	21	22	23	24	
1 Aug	552	486	570	744	810	1,116	822	852	750	714	540	468	12,570
2 Aug	558	408	882	1,194	1,680	1,368	960	1,014	492	270	294	294	12,336
3 Aug	318	138	192	408	384	342	666	522	324	696	846	714	7,260
4 Aug	144	456	216	240	402	414	300	720	1,038	480	492	168	8,262
5 Aug	594	480	792	684	954	480	924	696	630	1,152	492	366	10,992
6 Aug	480	348	348	342	426	486	468	444	276	270	606	222	7,098
7 Aug	222	270	408	276	318	258	390	198	390	258	174	336	5,514
8 Aug	168	252	174	318	258	210	48	480	342	576	492	342	6,462
9 Aug	252	264	174	300	378	456	360	318	294	510	444	336	6,798
10 Aug	432	390	210	324	504	366	474	402	234	504	408	510	8,442
11 Aug	138	192	138	144	330	234	348	324	510	456	438	312	6,504
12 Aug	138	330	288	402	270	420	624	474	948	444	456	420	8,466
13 Aug	180	240	288	414	372	318	420	594	636	684	540	300	7,344
14 Aug	216	168	180	414	516	300	606	858	1,410	1,008	1,158	1,254	10,626
15 Aug	498	198	516	708	672	606	1,224	444	888	1,572	870	744	12,300
16 Aug	492	246	504	1,266	1,254	1,788	1,092	1,926	2,124	1,296	2,130	1,242	18,475
Total	29,829	31,254	30,960	37,258	35,304	32,952	32,604	37,596	35,808	37,974	41,928	35,340	687,186
	4.3	4.5	4.5	5.4	5.1	4.8	4.7	5.5	5.2	5.5	6.1	5.1	
	43.4	47.9	52.4	57.9	63.0	67.8	72.5	78.0	83.2	88.8	94.9	100.0	

APPENDIX B: KASILOF RIVER DATA

Appendix B1.—Estimated sockeye salmon escapement (DIDSON) along the north bank of the Kaslof River, 2012.

Date	Daily	Cum	Date	Daily	Cum
15 Jun	2,040	2,040	15 Jul	19,926	69,822
16 Jun	456	2,496	16 Jul	23,124	92,946
17 Jun	480	2,976	17 Jul	2,142	95,088
18 Jun	1,068	4,044	18 Jul	5,598	100,686
19 Jun	1,380	5,424	19 Jul	4,998	105,684
20 Jun	1,848	7,272	20 Jul	10,098	115,782
21 Jun	2,490	9,762	21 Jul	23,844	139,626
22 Jun	1,458	11,220	22 Jul	10,068	149,694
23 Jun	1,578	12,798	23 Jul	3,456	153,150
24 Jun	1,512	14,310	24 Jul	5,766	158,916
25 Jun	1,332	15,642	25 Jul	23,574	182,490
26 Jun	2,022	17,664	26 Jul	17,554	200,044
27 Jun	3,294	20,958	27 Jul	15,084	215,128
28 Jun	3,558	24,516	28 Jul	5,940	221,068
29 Jun	1,896	26,412	29 Jul	3,000	224,068
30 Jun	3,588	30,000	30 Jul	3,318	227,386
1 Jul	2,346	32,346	31 Jul	2,658	230,044
2 Jul	2,424	34,770	1 Aug	2,124	232,168
3 Jul	1,296	36,066	2 Aug	1,836	234,004
4 Jul	450	36,516	3 Aug	1,842	235,846
5 Jul	624	37,140	4 Aug	1,986	237,832
6 Jul	360	37,500	5 Aug	1,416	239,248
7 Jul	1,440	38,940	6 Aug	1,308	240,556
8 Jul	1,668	40,608	7 Aug	1,314	241,870
9 Jul	1,224	41,832	8 Aug	912	242,782
10 Jul	1,338	43,170	9 Aug	732	243,514
11 Jul	1,398	44,568	10 Aug	600	244,114
12 Jul	756	45,324	11 Aug	498	244,612
13 Jul	1,386	46,710	12 Aug	432	245,044
14 Jul	3,186	49,896	13 Aug	486	245,530

Note: No other species were apportioned from the escapement estimates.

Appendix B2.—Estimated sockeye salmon escapement (DIDSON) along the south bank of the Kaslof River, 2012.

Date	Daily	Cum	Date	Daily	Cum
15 Jun	618	618	15 Jul	5,220	59,850
16 Jun	216	834	16 Jul	5,976	65,826
17 Jun	192	1,026	17 Jul	888	66,714
18 Jun	366	1,392	18 Jul	2,226	68,940
19 Jun	594	1,986	19 Jul	2,418	71,358
20 Jun	750	2,736	20 Jul	2,658	74,016
21 Jun	1,062	3,798	21 Jul	5,418	79,434
22 Jun	924	4,722	22 Jul	9,210	88,644
23 Jun	732	5,454	23 Jul	2,808	91,452
24 Jun	1,902	7,356	24 Jul	1,332	92,784
25 Jun	1,566	8,922	25 Jul	3,024	95,808
26 Jun	1,692	10,614	26 Jul	3,336	99,144
27 Jun	3,198	13,812	27 Jul	3,228	102,372
28 Jun	5,142	18,954	28 Jul	3,715	106,087
29 Jun	3,294	22,248	29 Jul	4,152	110,239
30 Jun	3,252	25,500	30 Jul	2,526	112,765
1 Jul	3,264	28,764	31 Jul	2,658	115,423
2 Jul	3,480	32,244	1 Aug	2,208	117,631
3 Jul	3,804	36,048	2 Aug	1,584	119,215
4 Jul	852	36,900	3 Aug	1,182	120,397
5 Jul	1,152	38,052	4 Aug	1,464	121,861
6 Jul	270	38,322	5 Aug	1,506	123,367
7 Jul	714	39,036	6 Aug	841	124,208
8 Jul	1,104	40,140	7 Aug	858	125,066
9 Jul	1,728	41,868	8 Aug	690	125,756
10 Jul	2,688	44,556	9 Aug	603	126,359
11 Jul	1,830	46,386	10 Aug	720	127,079
12 Jul	1,980	48,366	11 Aug	690	127,769
13 Jul	2,838	51,204	12 Aug	612	128,381
14 Jul	3,426	54,630	13 Aug	612	128,993

Note: No other species were apportioned from the escapement estimates.

Appendix B3.—Kasilof River north bank DIDSON subsample estimates by day and hour, 2012.

Date	Estimates by Hour											
	1	2	3	4	5	6	7	8	9	10	11	12
15 Jun	102	174	138	264	192	84	134	88	114	18	30	18
16 Jun	60	42	36	54	36	18	18	0	12	30	0	0
17 Jun	6	42	60	30	30	42	18	18	0	0	0	0
18 Jun	72	72	6	30	0	0	66	60	36	6	60	36
19 Jun	30	12	30	36	54	114	90	30	60	24	108	12
20 Jun	108	72	54	84	36	48	24	54	60	12	42	78
21 Jun	234	90	96	78	60	84	24	102	66	162	108	96
22 Jun	96	60	66	42	66	24	24	30	66	18	24	66
23 Jun	54	30	36	24	48	18	30	30	78	0	0	78
24 Jun	66	66	66	36	24	6	0	6	36	108	30	24
25 Jun	36	24	36	24	18	18	30	6	24	240	30	18
26 Jun	12	60	36	36	48	72	54	42	72	90	234	18
27 Jun	60	30	30	36	60	120	156	216	198	180	18	192
28 Jun	120	102	138	18	30	54	78	180	126	120	18	36
29 Jun	96	36	6	24	60	60	24	36	42	6	12	30
30 Jun	342	318	252	42	294	96	192	90	66	12	24	36
1 Jul	150	276	132	42	24	60	66	30	66	18	30	18
2 Jul	48	96	78	54	42	42	84	156	78	12	18	42
3 Jul	18	24	60	36	60	18	30	150	6	24	24	12
4 Jul	24	18	12	12	24	12	12	18	18	6	18	30
5 Jul	12	18	6	6	6	12	72	24	30	24	30	0
6 Jul	12	6	6	6	0	0	18	0	24	24	24	0
7 Jul	12	12	0	6	6	18	30	150	84	24	48	120
8 Jul	60	42	24	30	36	18	12	42	348	150	30	24
9 Jul	24	18	30	24	48	12	30	60	90	60	24	102
10 Jul	72	42	42	18	24	30	30	12	12	6	54	72
11 Jul	78	30	114	84	60	42	30	60	66	36	66	102
12 Jul	12	30	36	30	12	36	54	12	30	24	24	6
13 Jul	54	30	48	54	30	30	18	36	30	18	0	18
14 Jul	204	234	120	24	90	72	48	30	18	6	36	78
15 Jul	372	564	1,092	1,002	1,164	744	342	234	120	126	258	342
16 Jul	1,350	1,866	2,574	2,988	3,096	2,388	1,296	552	546	336	366	210
17 Jul	126	72	6	42	18	54	18	54	66	36	90	18
18 Jul	330	222	90	96	204	300	144	60	312	486	180	144
19 Jul	288	132	90	66	192	264	396	60	426	444	90	72
20 Jul	150	156	162	153	135	210	240	114	306	300	432	198
21 Jul	444	738	360	504	492	396	1,260	366	102	2,580	1,350	1230
22 Jul	534	396	234	240	492	318	486	372	252	36	726	534
23 Jul	216	96	96	108	42	78	42	24	348	96	18	492
24 Jul	126	126	126	84	54	120	84	96	78	732	114	288
25 Jul	498	564	924	216	300	144	684	822	936	870	1,704	618
26 Jul	468	576	588	396	582	390	108	270	534	318	510	1098
27 Jul	306	270	198	300	300	348	498	336	1,002	552	1,032	570
28 Jul	342	138	120	60	144	48	276	180	54	444	378	330
29 Jul	30	42	132	36	48	156	318	60	126	78	168	282
30 Jul	54	60	48	90	90	126	156	84	42	150	114	72
31 Jul	48	48	54	24	276	132	24	114	60	162	96	114

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Date	Estimates by Hour												Daily Total
	13	14	15	16	17	18	19	20	21	22	23	24	
15 Jun	66	42	48	72	96	72	54	84	78	30	12	30	2,040
16 Jun	0	6	0	0	18	36	12	30	12	18	0	18	456
17 Jun	18	12	12	0	12	0	12	6	60	12	30	60	480
18 Jun	18	12	12	6	0	0	6	90	96	108	228	48	1,068
19 Jun	72	42	0	18	30	6	6	30	126	126	216	108	1,380
20 Jun	54	36	48	36	18	42	30	6	216	216	222	252	1,848
21 Jun	84	90	36	42	48	18	42	12	216	198	258	246	2,490
22 Jun	102	30	6	24	60	42	12	42	12	126	246	174	1,458
23 Jun	48	138	78	72	18	60	90	12	18	132	294	192	1,578
24 Jun	78	162	12	18	60	18	60	36	156	222	60	162	1,512
25 Jun	12	78	72	12	18	18	54	60	54	258	108	84	1,332
26 Jun	0	42	78	60	36	30	24	24	60	288	354	252	2,022
27 Jun	36	36	18	60	60	108	72	96	204	252	348	708	3,294
28 Jun	168	186	48	36	30	132	222	114	156	258	450	738	3,558
29 Jun	30	66	96	102	30	174	96	78	90	60	282	360	1,896
30 Jun	108	30	132	294	168	300	258	198	78	90	36	132	3,588
1 Jul	12	12	156	90	228	144	336	138	174	42	90	12	2,346
2 Jul	66	60	72	168	132	258	234	204	186	138	114	42	2,424
3 Jul	0	36	30	18	54	180	54	42	168	156	96	0	1,296
4 Jul	12	12	0	18	6	18	18	36	18	66	24	18	450
5 Jul	42	24	18	30	18	84	24	96	12	12	24	0	624
6 Jul	6	6	0	0	0	24	30	18	84	24	42	6	360
7 Jul	30	24	18	42	24	30	48	108	216	126	60	204	1,440
8 Jul	150	18	24	42	66	12	66	114	138	54	84	84	1,668
9 Jul	30	126	54	6	54	48	6	108	72	102	66	30	1,224
10 Jul	12	36	72	54	66	30	48	132	114	138	144	78	1,338
11 Jul	60	36	60	36	12	108	36	60	36	60	120	6	1,398
12 Jul	42	48	72	54	0	60	54	66	18	6	18	12	756
13 Jul	102	54	102	84	84	120	162	108	18	78	42	66	1,386
14 Jul	6	54	108	96	144	168	132	198	480	438	210	192	3,186
15 Jul	414	390	984	1,188	3,108	918	162	1,038	1,662	1,290	1,134	1,278	19,926
16 Jul	48	618	390	570	438	1,566	450	438	474	372	120	72	23,124
17 Jul	24	12	48	36	84	108	288	168	150	114	288	222	2,142
18 Jul	138	210	84	60	288	138	492	198	114	576	414	318	5,598
19 Jul	144	42	168	60	156	390	486	216	132	306	198	180	4,998
20 Jul	102	228	180	120	186	204	834	246	918	2,100	1,806	618	10,098
21 Jul	1,572	1,860	1,572	1,338	1,086	1,026	1,116	1,434	114	36	2,034	834	23,844
22 Jul	264	240	462	378	834	546	600	384	780	198	150	612	10,068
23 Jul	282	126	180	132	60	216	372	96	138	72	72	54	3,456
24 Jul	102	192	192	240	240	288	234	594	288	960	252	156	5,766
25 Jul	1,140	990	990	828	1,566	852	1,338	1,680	2,706	864	1,926	414	23,574
26 Jul	1,044	858	450	786	912	940	864	1,446	1,980	378	984	1,074	17,554
27 Jul	1,080	552	894	1,068	342	678	330	612	1,068	1,290	702	756	15,084
28 Jul	234	246	174	432	132	696	534	276	408	138	72	84	5,940
29 Jul	102	138	102	126	144	84	114	408	198	24	18	66	3,000
30 Jul	150	162	96	102	318	216	54	348	450	174	72	90	3,318
31 Jul	102	84	192	84	90	114	108	60	288	258	78	48	2,658

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Date	Estimates by Hour											
	1	2	3	4	5	6	7	8	9	10	11	12
1 Aug	54	48	60	60	48	204	120	36	36	174	252	216
2 Aug	84	96	48	90	102	102	186	84	36	12	120	72
3 Aug	36	24	18	0	42	0	24	12	90	78	78	60
4 Aug	84	36	0	18	18	6	18	36	102	210	108	60
5 Aug	78	48	18	18	24	36	54	36	30	186	60	120
6 Aug	30	30	12	12	12	12	12	18	30	42	132	78
7 Aug	66	54	36	0	6	30	6	6	12	12	48	132
8 Aug	54	24	36	0	0	0	12	6	30	18	36	6
9 Aug	66	30	42	18	0	12	12	12	18	48	12	6
10 Aug	48	12	0	12	0	0	6	6	0	6	0	24
11 Aug	6	18	18	24	6	6	12	0	12	0	6	42
12 Aug	18	6	12	18	12	12	30	0	42	0	24	18
13 Aug	78	24	6	6	18	12	18	18	6	12	6	18
Total	8,659	8,624	8,997	7,969	9,440	7,914	8,385	5,844	7,719	10,012	9,683	8,838
%	3.5	3.5	3.7	3.2	3.8	3.2	3.4	2.4	3.1	4.1	3.9	3.6
Cum	3.5	7.0	10.7	13.9	17.8	21.0	24.4	26.8	30.0	34.0	38.0	41.6

Date	Estimates by Hour												Daily Total
	13	14	15	16	17	18	19	20	21	22	23	24	
1 Aug	90	84	30	36	24	42	156	36	42	66	168	42	2,124
2 Aug	72	6	12	24	54	30	18	162	120	138	120	48	1,836
3 Aug	36	24	156	120	72	84	18	342	168	168	132	60	1,842
4 Aug	66	168	108	126	144	168	12	42	366	42	0	48	1,986
5 Aug	12	24	138	66	12	42	18	126	78	108	84	0	1,416
6 Aug	66	48	120	36	24	60	132	114	132	84	24	48	1,308
7 Aug	72	132	42	120	66	24	66	54	144	66	78	42	1,314
8 Aug	42	30	54	48	102	42	36	30	84	108	72	42	912
9 Aug	24	18	0	18	24	66	42	54	60	72	48	30	732
10 Aug	18	24	90	102	42	42	18	66	18	18	42	6	600
11 Aug	6	18	24	6	6	30	42	114	48	18	6	30	498
12 Aug	6	0	18	0	12	12	18	18	6	18	78	54	432
13 Aug	0	18	18	6	54	36	30	6	30	0	30	36	486
Total	8,929	9,110	9,465	9,862	12,227	12,016	11,299	13,172	16,551	13,912	15,503	11,700	245,530
%	3.6	3.7	3.9	4.0	5.0	4.9	4.6	5.4	6.7	5.7	6.3	4.8	
Cum	45.2	48.9	52.8	56.8	61.8	66.7	71.3	76.6	83.4	89.0	95.4	100	

Appendix B4.—Kasilof River south bank DIDSON subsample estimates by day and hour, 2012.

Date	Estimates by Hour											
	1	2	3	4	5	6	7	8	9	10	11	12
15 Jun	48	48	72	132	36	48	12	30	48	6	36	12
16 Jun	12	36	48	30	12	0	0	24	6	0	0	0
17 Jun	18	12	6	24	0	18	6	0	-6	18	6	6
18 Jun	18	24	18	60	18	6	12	0	24	6	0	18
19 Jun	48	-6	36	6	18	36	48	24	36	12	6	30
20 Jun	54	72	42	18	24	12	18	30	0	18	18	84
21 Jun	30	84	90	12	6	102	42	30	18	108	42	96
22 Jun	72	48	114	168	36	18	12	48	24	0	0	48
23 Jun	72	18	48	60	0	24	6	6	102	0	0	36
24 Jun	72	102	66	54	12	36	-6	12	42	66	24	30
25 Jun	180	48	102	96	54	42	12	12	24	66	126	66
26 Jun	42	42	144	102	48	66	48	30	90	114	282	138
27 Jun	12	18	30	30	12	60	84	48	162	132	144	696
28 Jun	72	78	324	144	90	54	18	66	156	282	144	72
29 Jun	318	114	42	90	240	150	258	198	60	60	36	66
30 Jun	552	102	102	144	390	264	270	66	18	0	18	102
1 Jul	144	360	378	180	132	444	168	84	36	66	42	72
2 Jul	48	144	192	564	180	144	234	228	78	162	102	78
3 Jul	72	108	198	174	834	366	114	384	264	84	96	42
4 Jul	42	60	54	90	84	60	78	24	48	42	6	12
5 Jul	6	24	12	30	0	24	264	84	144	204	72	30
6 Jul	18	0	6	0	0	12	6	24	0	18	30	0
7 Jul	30	18	12	24	12	24	18	90	66	42	24	60
8 Jul	30	36	30	48	6	0	18	30	192	108	24	18
9 Jul	228	192	102	132	42	6	6	30	18	30	192	30
10 Jul	78	192	72	42	24	18	18	12	72	102	276	324
11 Jul	18	66	132	144	90	60	90	54	54	66	54	192
12 Jul	24	42	18	36	42	60	18	36	6	66	60	84
13 Jul	204	72	48	42	24	78	126	18	6	42	18	30
14 Jul	150	348	264	210	222	252	330	120	42	42	24	108
15 Jul	174	192	432	456	522	444	498	198	144	234	372	426
16 Jul	240	516	720	786	1,074	600	258	198	156	138	216	96
17 Jul	66	48	60	18	36	48	36	36	18	54	36	24
18 Jul	96	108	126	84	312	384	198	150	72	210	54	18
19 Jul	24	78	162	114	180	528	324	102	66	114	84	6
20 Jul	114	102	132	198	246	324	522	102	216	204	60	66
21 Jul	48	204	264	474	522	432	1,284	714	132	486	114	72
22 Jul	66	354	834	300	888	516	696	2,550	480	78	618	420
23 Jul	150	144	96	102	84	72	90	72	528	204	42	252
24 Jul	132	168	90	42	36	42	12	90	36	114	48	54
25 Jul	222	324	270	306	246	330	168	204	72	66	180	132
26 Jul	96	114	126	228	222	240	300	264	450	198	30	108
27 Jul	162	126	132	72	246	306	282	138	120	138	150	126
28 Jul	210	294	96	252	78	258	276	402	432	90	192	174
29 Jul	96	78	66	18	66	234	732	426	336	252	132	72
30 Jul	78	90	162	174	180	150	96	120	108	198	60	84
31 Jul	78	36	90	90	540	198	84	114	48	66	36	60

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Date	Estimates by Hour												Daily Total
	13	14	15	16	17	18	19	20	21	22	23	24	
15 Jun	0	0	0	6	18	6	12	0	24	18	6	0	618
16 Jun	0	0	0	24	0	6	12	6	0	0	0	0	216
17 Jun	6	0	6	0	12	0	0	0	0	30	6	24	192
18 Jun	0	0	18	0	0	6	0	24	0	0	108	6	366
19 Jun	36	0	0	18	0	6	72	0	72	66	30	0	594
20 Jun	66	42	24	0	0	12	0	24	66	66	18	42	750
21 Jun	18	36	12	54	18	0	12	0	108	48	48	48	1,062
22 Jun	12	0	0	12	78	6	12	6	6	78	66	60	924
23 Jun	12	54	24	6	0	6	6	0	12	114	96	30	732
24 Jun	174	132	24	84	6	30	18	66	396	186	66	210	1,902
25 Jun	42	102	30	60	54	24	36	18	42	126	186	18	1,566
26 Jun	48	90	114	36	24	6	6	12	0	12	126	72	1,692
27 Jun	432	42	162	402	120	78	84	60	30	12	48	300	3,198
28 Jun	228	852	228	174	144	216	402	102	174	60	108	954	5,142
29 Jun	96	108	354	132	96	234	66	156	48	60	78	234	3,294
30 Jun	36	102	120	204	234	138	108	78	36	78	48	42	3,252
1 Jul	60	126	120	138	186	90	120	114	114	24	36	30	3,264
2 Jul	60	102	114	144	186	114	114	150	150	102	24	66	3,480
3 Jul	30	18	60	18	60	246	144	78	156	156	30	72	3,804
4 Jul	36	24	18	12	-6	12	6	18	24	60	36	12	852
5 Jul	42	6	30	24	0	12	54	48	18	12	12	0	1,152
6 Jul	30	6	6	6	6	12	0	12	12	18	18	30	270
7 Jul	24	18	18	12	12	18	12	6	24	42	0	108	714
8 Jul	54	60	18	36	24	24	36	24	96	90	36	66	1,104
9 Jul	78	102	48	36	24	18	54	96	42	162	30	30	1,728
10 Jul	48	66	222	138	114	66	126	90	126	150	270	42	2,688
11 Jul	54	66	72	66	36	156	36	36	60	66	66	96	1,830
12 Jul	120	144	168	78	156	120	48	84	60	54	72	384	1,980
13 Jul	90	84	234	168	168	108	204	60	114	156	204	540	2,838
14 Jul	90	96	6	210	168	96	84	60	120	72	144	168	3,426
15 Jul	372	156	156	78	54	6	30	78	90	36	48	24	5,220
16 Jul	96	72	36	60	102	270	78	66	72	60	36	30	5,976
17 Jul	24	6	18	54	54	36	54	18	24	42	42	36	888
18 Jul	30	42	24	54	30	18	36	36	30	66	30	18	2,226
19 Jul	6	36	36	30	72	30	24	48	12	36	180	126	2,418
20 Jul	18	6	42	66	12	36	24	48	60	36	12	12	2,658
21 Jul	78	78	48	6	78	24	12	12	30	12	264	30	5,418
22 Jul	246	30	54	36	66	42	174	198	198	36	72	258	9,210
23 Jul	90	156	144	42	72	36	24	102	78	156	48	24	2,808
24 Jul	84	60	18	66	18	24	42	18	18	24	60	36	1,332
25 Jul	24	66	18	30	6	36	96	48	30	54	42	54	3,024
26 Jul	54	42	36	294	144	96	48	108	54	6	18	60	3,336
27 Jul	18	24	210	78	216	48	96	174	60	42	54	210	3,228
28 Jul	54	24	138	162	30	126	85	78	54	42	66	102	3,715
29 Jul	168	132	90	168	30	144	288	108	222	102	132	60	4,152
30 Jul	132	192	42	36	90	96	42	72	72	162	42	48	2,526
31 Jul	90	60	18	30	96	48	132	36	234	102	222	150	2,658

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Date	Estimates by Hour											
	1	2	3	4	5	6	7	8	9	10	11	12
1 Aug	78	72	126	72	48	402	234	120	84	96	108	90
2 Aug	240	42	132	141	42	30	27	30	30	24	36	84
3 Aug	12	36	12	12	12	0	66	12	54	90	60	12
4 Aug	108	30	18	0	0	48	18	30	24	90	78	66
5 Aug	48	54	24	12	24	12	144	114	24	48	108	42
6 Aug	18	72	48	18	12	6	60	42	12	30	108	0
7 Aug	54	42	60	18	0	0	18	30	46.8	120	12	84
8 Aug	12	30	6	12	18	24	24	66	0	18	24	12
9 Aug	30	18	30	24	0	6	6	36	24	0	48	36
10 Aug	18	36	36	18	6	0	0	12	6	48	60	54
11 Aug	18	34	33.8	35	34	34	35	35	35	60	48	18
12 Aug	30	0	24	42	0	18	54	78	6	12	30	48
13 Aug	60	30	24	12	18	0	12	0	12	6	48	6
Total	5,490	5,974	7,234	7,016	8,380	8,170	8,882	8,327	5,602	5,448	5,094	5,322
%	4.3	4.6	5.6	5.4	6.5	6.3	6.9	6.5	4.3	4.2	3.9	4.1
Cum	4.3	4.6	5.6	5.4	6.5	6.3	6.9	6.5	4.3	4.2	3.9	4.1

Date	Counts by Hour												Daily Total
	13	14	15	16	17	18	19	20	21	22	23	24	
1 Aug	48	54	24	60	30	48	60	72	60	30	78	114	2,208
2 Aug	66	42	30	18	36	48	54	84	78	90	108	72	1,584
3 Aug	24	54	54	48	42	66	30	66	90	84	174	72	1,182
4 Aug	198	78	156	108	48	12	18	84	120	18	90	24	1,464
5 Aug	78	96	78	12	30	60	84	186	30	54	90	54	1,506
6 Aug	30	30	30	37.2	36	18	78	24	42	24	66	0	841
7 Aug	31	6	24	30	42	48	6	36	12	42	60	36	858
8 Aug	30	24	6	60	78	72	24	6	36	24	42	42	690
9 Aug	42	6	12	30	30	22.8	34.2	24	36	54	36	18	603
10 Aug	6	60	30	66	18	60	30	30	33	33	18	42	720
11 Aug	24	6	6	0	18	54	18	30	30	36	18	30	690
12 Aug	18	18	12	6	18	24	18	30	0	48	42	36	612
13 Aug	78	12	42	48	36	0	0	6	54	48	48	12	612
Total	4,279	4,146	3,882	4,111	3,570	3,515	3,623	3,354	4,089	3,717	4,254	5,514	128,993
%	3.3	3.2	3.0	3.2	2.8	2.7	2.8	2.6	3.2	2.9	3.3	4.3	
Cum	3.3	3.2	3.0	3.2	2.8	2.7	2.8	2.6	3.2	2.9	3.3	4.3	

APPENDIX C: YENTNA RIVER DATA

Appendix C1.—Estimated salmon escapement ranges along the north bank of the Yentna River, 2012.

Date	Sockeye				Pink			
	Daily		Cum		Daily		Cum	
	Min	Max	Min	Max	Min	Max	Min	Max
7 Jul	22	88	22	88	0	0	0	0
8 Jul	30	30	52	118	0	0	0	0
9 Jul	0	0	52	118	31	31	31	31
10 Jul	48	87	100	205	9	48	40	79
11 Jul	18	55	118	260	17	54	57	133
12 Jul	33	68	151	328	0	0	57	133
13 Jul	86	217	237	545	46	214	103	347
14 Jul	0	0	237	545	0	0	103	347
15 Jul	40	169	277	714	8	76	112	423
16 Jul	158	306	435	1,020	18	122	129	544
17 Jul	901	1,486	1,336	2,507	41	320	170	865
18 Jul	3,425	4,491	4,760	6,998	35	310	205	1,174
19 Jul	713	1,664	5,474	8,662	68	548	274	1,723
20 Jul	450	1,189	5,923	9,851	264	1,448	538	3,171
21 Jul	263	734	6,187	10,584	303	1,339	841	4,510
22 Jul	308	811	6,495	11,396	236	1,173	1,077	5,683
23 Jul	728	1,845	7,223	13,241	671	2,514	1,748	8,196
24 Jul	479	1,243	7,702	14,484	508	2,027	2,257	10,224
25 Jul	246	754	7,948	15,239	709	2,339	2,965	12,562
26 Jul	164	775	8,112	16,014	2,939	5,892	5,904	18,454
27 Jul	104	555	8,216	16,569	5,312	9,477	11,217	27,931
28 Jul	84	409	8,300	16,978	5,778	11,318	16,995	39,249
29 Jul	117	523	8,417	17,501	5,578	11,936	22,573	51,184
30 Jul	42	190	8,459	17,691	2,994	6,288	25,567	57,472
31 Jul	79	293	8,539	17,984	2,085	5,405	27,652	62,877
1 Aug	41	148	8,580	18,132	732	2,531	28,383	65,408
2 Aug	45	172	8,624	18,304	1,565	3,892	29,948	69,300
3 Aug	188	627	8,812	18,931	1,060	3,008	31,008	72,308
4 Aug	107	357	8,919	19,288	552	1,962	31,560	74,270
5 Aug	63	215	8,981	19,503	498	1,570	32,057	75,840
6 Aug	123	416	9,104	19,919	650	2,512	32,707	78,352
7 Aug	92	324	9,196	20,243	1,050	3,842	33,757	82,194
8 Aug	41	144	9,237	20,386	412	1,659	34,169	83,853
9 Aug	55	182	9,292	20,568	253	911	34,422	84,763
10 Aug	17	57	9,309	20,626	139	544	34,561	85,307
11 Aug	42	134	9,350	20,759	80	430	34,641	85,738
12 Aug	9	34	9,360	20,793	78	431	34,719	86,169
13 Aug	15	56	9,374	20,850	19	122	34,738	86,291
14 Aug	22	75	9,396	20,925	20	128	34,758	86,419
15 Aug	3	18	9,399	20,943	4	34	34,762	86,453

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Date	Chum				Coho			
	Daily		Cum		Daily		Cum	
	Min	Max	Min	Max	Min	Max	Min	Max
7 Jul	0	0	0	0	38	104	38	104
8 Jul	0	0	0	0	0	0	38	104
9 Jul	0	0	0	0	0	0	38	104
10 Jul	0	0	0	0	0	0	38	104
11 Jul	0	0	0	0	0	0	38	104
12 Jul	22	57	22	57	0	0	38	104
13 Jul	106	219	128	276	20	148	58	252
14 Jul	49	208	177	483	146	305	204	557
15 Jul	39	151	216	634	170	442	375	999
16 Jul	54	170	270	804	31	204	406	1,203
17 Jul	145	536	415	1,340	101	723	506	1,926
18 Jul	161	725	576	2,065	141	1,200	647	3,126
19 Jul	174	662	750	2,727	374	1,762	1,021	4,888
20 Jul	418	1,098	1,168	3,825	374	1,895	1,395	6,783
21 Jul	232	578	1,400	4,403	240	1,298	1,635	8,081
22 Jul	88	254	1,488	4,656	262	1,300	1,897	9,381
23 Jul	52	157	1,540	4,814	222	1,597	2,119	10,978
24 Jul	67	197	1,607	5,011	274	1,641	2,393	12,619
25 Jul	49	150	1,656	5,160	317	1,823	2,710	14,442
26 Jul	62	204	1,718	5,365	352	2,841	3,062	17,282
27 Jul	41	137	1,759	5,502	500	4,256	3,561	21,539
28 Jul	79	262	1,838	5,765	776	6,016	4,337	27,555
29 Jul	99	324	1,937	6,089	985	6,997	5,323	34,552
30 Jul	42	138	1,979	6,226	508	3,672	5,830	38,224
31 Jul	51	164	2,030	6,390	652	3,846	6,482	42,070
1 Aug	21	65	2,051	6,455	517	2,306	6,999	44,376
2 Aug	60	190	2,111	6,645	438	2,677	7,437	47,053
3 Aug	136	406	2,247	7,051	330	2,066	7,768	49,119
4 Aug	99	284	2,346	7,335	368	1,780	8,135	50,899
5 Aug	71	210	2,417	7,544	243	1,286	8,379	52,185
6 Aug	185	510	2,602	8,054	562	2,496	8,941	54,681
7 Aug	264	734	2,865	8,789	843	3,724	9,784	58,405
8 Aug	244	616	3,110	9,405	416	1,753	10,200	60,158
9 Aug	41	120	3,151	9,525	173	833	10,373	60,991
10 Aug	83	209	3,234	9,733	124	551	10,497	61,542
11 Aug	57	165	3,290	9,898	174	613	10,671	62,155
12 Aug	64	202	3,354	10,100	220	663	10,891	62,818
13 Aug	11	39	3,366	10,140	79	227	10,970	63,044
14 Aug	19	64	3,385	10,204	77	245	11,047	63,290
15 Aug	4	15	3,389	10,219	47	99	11,095	63,389

Appendix C2.—Estimated salmon escapement ranges along the south bank of the Yentna River, 2012.

Date	Sockeye				Pink			
	Daily		Cum		Daily		Cum	
	Min	Max	Min	Max	Min	Max	Min	Max
7 Jul	14	37	14	37	8	45	8	45
8 Jul	102	102	116	139	0	0	8	45
9 Jul	0	0	116	139	0	0	8	45
10 Jul	0	0	116	139	0	0	8	45
11 Jul	17	40	133	179	0	0	8	45
12 Jul	52	97	185	277	2	20	10	65
13 Jul	44	137	229	414	10	55	20	120
14 Jul	54	149	284	563	0	0	20	120
15 Jul	60	180	344	744	38	254	58	373
16 Jul	50	184	393	928	18	144	76	517
17 Jul	1,434	2,313	1,827	3,241	25	220	101	738
18 Jul	2,492	3,427	4,319	6,668	61	503	162	1,240
19 Jul	356	900	4,675	7,568	190	1,005	351	2,245
20 Jul	250	856	4,925	8,424	1,059	3,099	1,411	5,344
21 Jul	587	1,838	5,512	10,262	914	3,271	2,325	8,615
22 Jul	2,006	5,888	7,517	16,151	2,691	8,699	5,016	17,313
23 Jul	2,721	9,902	10,238	26,053	6,681	17,423	11,696	34,737
24 Jul	2,301	8,347	12,539	34,399	5,857	15,328	17,553	50,065
25 Jul	1,154	4,966	13,694	39,365	6,427	14,179	23,980	64,244
26 Jul	1,720	7,386	15,414	46,751	13,731	30,346	37,711	94,590
27 Jul	1,342	6,859	16,756	53,610	26,054	48,392	63,765	142,982
28 Jul	766	3,673	17,522	57,283	21,016	41,602	84,781	184,583
29 Jul	343	1,487	17,865	58,770	15,969	35,069	100,750	219,653
30 Jul	264	1,052	18,129	59,822	7,803	18,613	108,552	238,265
31 Jul	234	869	18,363	60,691	5,722	14,645	114,275	252,911
1 Aug	272	958	18,635	61,650	3,148	9,612	117,423	262,523
2 Aug	216	776	18,852	62,426	4,147	12,281	121,570	274,804
3 Aug	254	1,158	19,106	63,583	3,146	6,557	124,715	281,360
4 Aug	323	1,083	19,429	64,667	1,783	6,000	126,498	287,360
5 Aug	408	1,453	19,838	66,120	3,684	9,821	130,183	297,181
6 Aug	392	1,305	20,229	67,425	1,712	6,882	131,894	304,063
7 Aug	150	510	20,379	67,936	730	3,449	132,625	307,512
8 Aug	55	189	20,434	68,125	355	1,543	132,980	309,055
9 Aug	99	312	20,533	68,437	140	789	133,120	309,844
10 Aug	41	133	20,575	68,570	119	540	133,240	310,384
11 Aug	34	118	20,609	68,688	43	296	133,283	310,680
12 Aug	39	134	20,648	68,822	17	128	133,300	310,808
13 Aug	37	128	20,685	68,950	22	160	133,322	310,968
14 Aug	36	139	20,722	69,089	6	52	133,328	311,020
15 Aug	40	152	20,762	69,241	8	68	133,336	311,088

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Date	Chum				Coho			
	Daily		Cum		Daily		Cum	
	Min	Max	Min	Max	Min	Max	Min	Max
7 Jul	0	0	0	0	16	65	16	65
8 Jul	0	0	0	0	0	0	16	65
9 Jul	48	48	48	48	0	0	16	65
10 Jul	0	0	48	48	72	72	88	137
11 Jul	20	43	68	91	0	0	88	137
12 Jul	0	0	68	91	10	62	98	199
13 Jul	178	301	246	392	12	87	110	286
14 Jul	69	212	315	604	64	258	174	545
15 Jul	117	330	432	934	154	570	329	1,115
16 Jul	28	106	460	1,040	143	423	472	1,538
17 Jul	106	464	566	1,504	172	1,171	644	2,709
18 Jul	173	717	739	2,222	112	955	756	3,664
19 Jul	305	776	1,044	2,998	211	1,175	967	4,839
20 Jul	676	1,633	1,720	4,631	223	1,641	1,190	6,480
21 Jul	1,191	2,572	2,911	7,203	215	1,667	1,405	8,147
22 Jul	529	1,543	3,440	8,747	477	3,951	1,881	12,097
23 Jul	590	1,831	4,030	10,577	614	5,739	2,495	17,836
24 Jul	331	1,047	4,361	11,624	638	5,750	3,133	23,586
25 Jul	385	1,223	4,745	12,847	588	5,305	3,721	28,891
26 Jul	749	2,383	5,494	15,230	1,726	14,113	5,447	43,004
27 Jul	387	1,290	5,881	16,520	2,309	20,208	7,755	63,212
28 Jul	432	1,423	6,313	17,944	2,639	20,812	10,394	84,024
29 Jul	389	1,263	6,702	19,207	3,064	21,198	13,458	105,223
30 Jul	264	845	6,966	20,052	1,901	12,190	15,359	117,413
31 Jul	200	636	7,167	20,687	1,717	10,299	17,076	127,712
1 Aug	199	611	7,366	21,298	1,522	7,901	18,598	135,613
2 Aug	519	1,542	7,885	22,840	1,850	9,826	20,448	145,440
3 Aug	354	1,076	8,239	23,916	325	2,744	20,772	148,184
4 Aug	204	605	8,443	24,521	1,023	5,177	21,795	153,361
5 Aug	297	913	8,740	25,434	1,065	6,673	22,860	160,033
6 Aug	778	2,043	9,518	27,477	1,580	7,020	24,440	167,054
7 Aug	668	1,742	10,186	29,219	1,124	4,318	25,564	171,371
8 Aug	337	811	10,523	30,030	418	1,752	25,982	173,123
9 Aug	304	755	10,826	30,785	314	1,255	26,296	174,378
10 Aug	273	543	11,100	31,328	124	619	26,419	174,997
11 Aug	149	429	11,248	31,756	228	732	26,648	175,729
12 Aug	131	375	11,379	32,132	173	559	26,821	176,288
13 Aug	79	240	11,458	32,371	144	460	26,965	176,749
14 Aug	82	267	11,540	32,638	160	460	27,124	177,209
15 Aug	97	311	11,637	32,950	184	532	27,309	177,741

Appendix C3.—Yentna River north bank DIDSON estimates (total fish) by day and hour, 2012.

Date	Estimates by Hour											
	1	2	3	4	5	6	7	8	9	10	11	12
7 Jul	18	12	6	12	6	12	0	12	6	0	0	0
8 Jul	6	0	6	0	12	0	0	0	0	0	0	0
9 Jul	0	6	0	0	0	0	6	0	7	0	6	0
10 Jul	0	12	0	0	0	0	0	0	6	24	0	12
11 Jul	0	0	0	0	0	0	0	0	0	0	0	6
12 Jul	12	18	0	12	0	12	0	6	0	0	0	6
13 Jul	24	18	0	1	6	0	18	12	6	12	6	12
14 Jul	18	18	18	0	6	0	18	6	18	12	6	18
15 Jul	12	30	0	12	12	42	18	6	12	6	6	0
16 Jul	30	18	12	24	24	12	6	18	0	0	18	12
17 Jul	36	54	60	42	84	18	6	36	42	90	48	180
18 Jul	108	468	522	498	204	162	186	84	90	114	270	666
19 Jul	228	186	120	120	120	120	83	60	30	96	306	78
20 Jul	126	198	156	174	150	42	132	96	48	132	72	210
21 Jul	204	198	294	156	108	78	36	66	30	54	60	144
22 Jul	162	138	84	114	90	54	12	48	36	36	24	48
23 Jul	312	150	246	240	210	180	66	108	36	108	36	132
24 Jul	156	270	126	102	102	96	66	108	108	132	84	126
25 Jul	186	198	144	198	72	66	66	120	42	108	66	162
26 Jul	324	282	330	210	102	114	108	84	102	96	258	342
27 Jul	1,140	1,092	1,020	510	348	288	228	216	90	222	138	174
28 Jul	534	1,302	1,050	954	318	216	366	126	168	222	114	744
29 Jul	2,082	1,380	1,386	1,470	336	270	479	156	186	216	324	612
30 Jul	1,386	924	546	612	174	162	120	138	78	108	240	240
31 Jul	354	480	318	288	288	126	102	72	36	138	198	270
1 Aug	144	270	204	96	162	36	54	42	42	108	66	96
2 Aug	342	210	276	366	228	144	102	156	48	78	138	138
3 Aug	336	240	318	222	176	66	102	108	144	144	162	138
4 Aug	96	84	78	114	192	252	192	96	155	134	162	84
5 Aug	132	102	54	42	78	78	42	36	24	24	84	60
6 Aug	96	102	132	204	180	120	48	84	111	60	162	252
7 Aug	120	162	312	216	162	102	36	90	36	54	108	324
8 Aug	306	120	102	96	72	84	24	150	78	96	66	114
9 Aug	108	72	66	108	24	36	30	36	12	18	42	78
10 Aug	66	30	6	48	54	12	48	18	18	36	30	78
11 Aug	18	48	36	66	48	42	6	54	0	24	30	24
12 Aug	66	36	0	126	48	30	36	48	18	30	24	30
13 Aug	18	12	24	18	6	6	0	24	6	12	12	6
14 Aug	54	12	30	6	12	6	18	6	0	0	24	12
15 Aug	0	18	12	0	0	6	0	0	0	12	6	6
Total	9,360	8,970	8,094	7,477	4,214	3,090	2,860	2,526	1,869	2,756	3,396	5,634
Hr %	8.0	7.7	6.9	6.4	3.6	2.6	2.4	2.2	1.6	2.4	2.9	4.8
Cum %	8.0	15.6	22.6	28.9	32.5	35.2	37.6	39.8	41.4	43.7	46.6	51.4

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Appendix C3.–Page 2 of 2.

Date	Estimates by Hour											
	13	14	15	16	17	18	19	20	21	22	23	24
7 Jul	0	12	6	0	0	0	12	0	0	6	6	0
8 Jul	0	0	6	0	0	-6	0	0	0	6	0	0
9 Jul	0	-6	-6	0	0	0	0	6	0	0	0	12
10 Jul	0	6	12	0	12	0	0	6	0	0	0	6
11 Jul	0	6	6	6	18	0	6	0	6	0	6	12
12 Jul	0	0	0	6	12	0	0	6	0	0	0	0
13 Jul	0	18	24	60	18	54	60	18	12	12	30	42
14 Jul	0	6	6	18	12	18	0	24	48	36	36	12
15 Jul	24	0	18	66	24	42	66	60	30	6	24	18
16 Jul	42	18	54	12	30	24	30	30	12	18	18	24
17 Jul	78	90	174	126	72	144	288	84	108	42	42	54
18 Jul	108	90	132	150	54	204	390	150	132	54	150	132
19 Jul	60	168	132	114	60	86	108	168	90	126	72	120
20 Jul	72	108	150	78	210	120	126	144	240	60	150	246
21 Jul	96	72	78	78	36	60	84	72	102	54	72	36
22 Jul	24	54	42	60	108	114	144	126	150	126	150	126
23 Jul	102	222	174	48	186	216	282	162	102	66	114	108
24 Jul	120	156	216	66	162	78	198	126	114	60	114	108
25 Jul	96	60	102	156	156	138	168	210	162	114	138	132
26 Jul	108	108	162	174	234	252	690	546	942	330	498	162
27 Jul	180	84	354	126	390	786	996	372	624	414	330	108
28 Jul	432	156	180	156	366	516	1,122	612	1,266	282	642	546
29 Jul	288	138	324	282	174	390	612	330	888	186	282	522
30 Jul	60	132	150	120	150	84	564	162	186	282	150	180
31 Jul	108	329	329	329	329	343	606	450	258	192	180	168
1 Aug	120	42	90	48	120	132	342	120	174	216	228	228
2 Aug	186	126	192	126	186	138	516	144	132	150	234	168
3 Aug	30	186	132	102	228	174	138	114	102	198	102	96
4 Aug	90	84	30	84	60	54	228	48	78	132	78	60
5 Aug	72	48	60	54	228	186	132	72	90	84	138	102
6 Aug	276	126	126	180	372	162	246	138	78	120	126	90
7 Aug	204	312	156	324	162	606	324	348	456	198	252	234
8 Aug	132	54	72	54	138	96	186	132	174	54	102	12
9 Aug	60	72	66	30	30	66	30	42	90	36	60	30
10 Aug	6	72	30	54	18	6	12	42	42	18	24	48
11 Aug	12	24	36	12	12	72	96	30	48	12	12	48
12 Aug	24	26	24	12	36	66	54	30	18	24	6	12
13 Aug	6	30	12	6	12	6	36	12	6	0	0	6
14 Aug	0	0	12	12	0	24	18	12	24	12	12	6
15 Aug	0	5	5	5	5	5	5	5	5	5	5	5
Total	3,216	3,234	3,868	3,334	4,420	5,456	8,915	5,153	6,989	3,731	4,583	4,019
Hr %	2.7	2.8	3.3	2.8	3.8	4.7	7.6	4.4	6.0	3.2	3.9	3.4
Cum %	54.2	56.9	60.2	63.1	66.8	71.5	79.1	83.5	89.5	92.7	96.6	100.0

Appendix C4.—Yentna River south bank DIDSON estimates (total fish) by day and hour, 2012.

Date	Counts by Hour											
	1	2	3	4	5	6	7	8	9	10	11	12
7 Jul	6	6	6	0	0	6	0	6	6	6	12	0
8 Jul	0	18	0	0	0	0	6	0	6	6	6	18
9 Jul	0	0	6	0	0	6	0	0	6	6	0	0
10 Jul	12	6	0	0	0	0	6	0	0	0	0	12
11 Jul	0	0	0	0	0	0	0	0	0	0	0	6
12 Jul	0	0	24	0	12	6	6	0	0	12	6	0
13 Jul	6	0	12	0	0	12	18	6	30	30	12	12
14 Jul	12	30	0	30	6	12	0	0	6	42	24	6
15 Jul	18	42	24	60	12	42	36	12	48	54	24	48
16 Jul	0	24	30	12	12	18	30	30	0	18	18	12
17 Jul	60	36	48	42	36	12	24	36	30	120	114	168
18 Jul	108	96	126	96	126	42	114	96	96	168	276	402
19 Jul	42	66	66	42	78	36	12	114	90	156	102	114
20 Jul	108	102	96	66	54	42	102	24	96	186	432	150
21 Jul	174	264	198	192	108	270	210	230	240	240	294	342
22 Jul	336	318	306	258	294	294	162	282	294	342	594	480
23 Jul	804	1,248	1,272	1,188	846	1,128	906	768	660	642	750	852
24 Jul	1,074	1,020	1,098	960	882	756	600	786	852	414	558	606
25 Jul	630	768	696	732	450	498	420	426	216	432	660	690
26 Jul	552	1,248	1,176	1,398	1,110	660	1,200	978	1,182	1,284	1,950	786
27 Jul	1,884	2,706	2,544	2,664	1,842	1,752	1,524	1,854	1,650	1,650	2,298	3,102
28 Jul	2,406	2,514	2,220	2,154	1,938	846	1,614	1,206	1,476	1,626	2,874	870
29 Jul	1,194	2,178	2,298	2,172	2,112	996	1,584	1,650	1,644	924	2,562	1,752
30 Jul	1,314	1,866	1,104	1,740	1,158	552	1,044	636	672	636	846	900
31 Jul	642	990	966	1,068	810	540	456	324	708	1,524	834	864
1 Aug	450	594	546	564	582	252	192	300	306	396	774	126
2 Aug	540	564	960	678	468	414	360	300	678	600	894	786
3 Aug	450	420	480	300	450	390	300	306	174	246	264	252
4 Aug	246	138	288	684	456	138	246	300	144	204	330	240
5 Aug	468	336	438	438	414	396	498	360	396	300	342	678
6 Aug	444	438	522	600	684	390	456	348	372	498	174	426
7 Aug	300	114	324	204	294	258	240	258	186	204	204	456
8 Aug	156	114	120	138	90	102	192	120	90	36	114	210
9 Aug	54	150	78	36	54	90	30	48	48	36	84	156
10 Aug	36	66	48	48	60	42	36	30	18	60	54	42
11 Aug	6	60	42	37	37	36	36	42	36	30	30	60
12 Aug	30	42	42	6	6	42	54	6	24	18	54	24
13 Aug	24	18	24	24	54	12	30	12	12	18	36	12
14 Aug	24	36	30	6	24	36	12	12	12	18	24	42
15 Aug	24	12	42	24	42	29	30	18	22	18	24	18
Total	14,634	18,648	18,300	18,661	15,601	11,153	12,786	11,924	12,526	13,200	18,648	15,720
Daily%	3.8	4.9	4.8	4.9	4.1	2.9	3.3	3.1	3.3	3.4	4.9	4.1
Cum%	3.8	8.7	13.5	18.4	22.4	25.3	28.7	31.8	35.1	38.5	43.4	47.5

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Appendix C4.–Page 2 of 2.

Date	Counts by Hour											
	13	14	15	16	17	18	19	20	21	22	23	24
7 Jul	0	6	0	6	6	0	0	6	6	0	0	6
8 Jul	6	0	12	6	6	0	6	0	6	0	0	0
9 Jul	0	0	0	6	0	6	6	0	0	6	0	0
10 Jul	0	0	12	0	0	0	0	6	6	12	0	0
11 Jul	0	6	6	0	18	0	0	0	6	0	6	12
12 Jul	0	0	12	12	6	0	0	0	0	6	6	12
13 Jul	6	12	42	36	0	18	12	24	42	12	30	12
14 Jul	36	18	6	30	24	18	0	12	12	24	36	12
15 Jul	36	29	54	24	6	30	30	54	24	30	24	42
16 Jul	24	0	30	48	42	36	24	24	18	18	18	42
17 Jul	78	252	156	120	186	210	210	126	288	138	162	228
18 Jul	378	168	222	102	450	114	162	396	120	72	36	54
19 Jul	132	120	168	102	132	78	156	84	84	66	72	96
20 Jul	204	240	60	384	360	156	162	444	252	390	120	138
21 Jul	318	216	300	144	450	84	246	300	150	138	180	222
22 Jul	720	648	678	378	522	396	906	774	636	834	702	756
23 Jul	1,206	642	1,254	1,326	1,068	864	1,062	474	738	834	420	618
24 Jul	750	954	402	848	972	1,008	876	942	492	798	576	594
25 Jul	876	756	1,014	1,200	666	924	960	816	840	672	534	612
26 Jul	1,692	1,308	2,370	2,286	1,674	1,470	1,218	3,066	2,322	1,338	1,338	1,428
27 Jul	2,562	2,334	2,148	4,488	2,400	2,178	1,272	4,254	1,530	1,746	1,068	1,560
28 Jul	1,014	1,788	2,508	2,376	1,974	2,070	2,058	3,252	2,268	1,854	1,554	1,620
29 Jul	1,602	1,908	1,242	1,740	1,998	1,500	1,602	2,844	924	1,662	534	852
30 Jul	714	366	516	720	774	864	828	732	816	852	894	930
31 Jul	684	606	792	786	750	636	738	630	366	594	450	390
1 Aug	498	504	552	654	396	636	528	774	768	486	564	564
2 Aug	654	744	528	804	714	684	834	756	558	522	678	642
3 Aug	336	270	293	293	293	293	293	293	293	420	288	192
4 Aug	270	300	282	594	456	354	378	444	306	342	414	330
5 Aug	456	540	720	804	852	492	408	696	654	570	360	258
6 Aug	516	480	420	564	366	390	456	444	414	444	240	216
7 Aug	342	312	186	396	480	120	138	204	264	228	168	108
8 Aug	90	48	114	78	144	96	66	138	96	132	48	24
9 Aug	72	114	48	102	102	72	84	36	102	90	72	78
10 Aug	30	48	36	48	42	72	54	24	42	42	66	36
11 Aug	78	18	66	36	78	48	30	30	18	48	48	18
12 Aug	30	42	0	84	18	18	18	36	54	36	24	42
13 Aug	18	18	24	54	24	30	18	18	12	42	36	36
14 Aug	0	18	36	24	6	60	60	18	30	24	18	18
15 Aug	48	30	30	30	30	30	30	30	30	30	30	30
Total	16,476	15,863	17,339	21,733	18,485	16,055	15,929	23,201	15,587	15,552	11,814	12,828
Daily%	4.3	4.1	4.5	5.7	4.8	4.2	4.2	6.1	4.1	4.1	3.1	3.4
Cum%	51.8	56.0	60.5	66.2	71.0	75.2	79.4	85.4	89.5	93.6	96.6	100.0

Appendix C5.—An independent and preliminary daily escapement estimate for the Yentna River using drift gill net (GN) catches to apportion daily sonar estimates by bank and species, 2012.

Date	North bank				South Bank			
	Sockeye	Pink	Chum	Coho	Sockeye	Pink	Chum	Coho
7 Jul	90	5	19	12	61	2	18	10
8 Jul	21	1	4	3	69	2	20	11
9 Jul	22	1	5	3	32	1	9	5
10 Jul	69	4	14	9	49	2	14	8
11 Jul	52	3	11	7	40	1	12	7
12 Jul	64	4	13	9	81	3	23	13
13 Jul	331	19	68	44	259	8	75	42
14 Jul	253	15	52	34	267	9	77	43
15 Jul	382	22	79	51	541	17	157	87
16 Jul	348	20	72	46	356	11	103	57
17 Jul	1,359	160	320	160	1,920	192	192	576
18 Jul	3,839	160	720	400	2,728	0	1,149	144
19 Jul	1,742	158	633	317	1,169	260	260	520
20 Jul	335	1,117	1,452	335	683	819	2,321	546
21 Jul	867	267	934	200	1,722	1,205	1,378	1,205
22 Jul	1,121	604	345	0	7,444	2,978	0	1,489
23 Jul	1,534	1,458	384	230	12,730	6,365	707	1,768
24 Jul	1,114	1,044	348	487	6,807	7,207	1,602	3,203
25 Jul	1,177	1,177	353	353	5,641	3,905	3,471	3,471
26 Jul	1,049	3,760	874	874	8,882	17,764	4,441	3,947
27 Jul	691	6,774	1,382	1,382	8,690	26,940	9,559	7,821
28 Jul	736	9,323	859	1,472	2,711	20,781	9,035	13,553
29 Jul	1,091	6,111	3,928	2,182	3,589	15,251	8,074	12,560
30 Jul	596	4,169	1,588	596	1,400	7,936	6,536	5,602
31 Jul	497	3,643	1,490	662	2,572	5,144	6,002	3,430
1 Aug	148	1,183	666	1,183	2,610	3,654	2,610	3,132
2 Aug	103	2,570	1,028	823	1,589	5,826	5,826	2,119
3 Aug	145	1,156	1,590	867	1,138	1,897	2,277	2,277
4 Aug	144	864	1,152	504	563	2,816	1,126	3,379
5 Aug	53	1,330	532	106	880	2,639	5,717	2,639
6 Aug	0	1,616	1,167	808	507	3,040	3,040	3,715
7 Aug	0	1,325	1,987	1,987	499	998	1,663	2,828
8 Aug	101	804	1,609	0	284	379	1,231	663
9 Aug	49	311	556	327	97	290	773	676
10 Aug	73	218	399	127	92	171	408	408
11 Aug	87	174	318	231	97	136	426	310
12 Aug	132	198	396	99	58	115	288	288
13 Aug	41	55	138	41	0	76	303	227
14 Aug	47	62	156	47	0	74	294	221
15 Aug	17	22	55	17	0	85	340	255
GN	20,519	51,909	27,696	17,035	78,853	138,998	81,558	83,254
FW	12,065	86,196	4,047	14,850	23,298	310,928	12,623	35,813

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Date	Both Banks			
	Sockeye	Pink	Chum	Coho
7 Jul	151	7	36	22
8 Jul	90	3	24	14
9 Jul	55	2	14	8
10 Jul	117	6	28	17
11 Jul	92	4	22	13
12 Jul	145	6	37	22
13 Jul	590	28	143	86
14 Jul	520	24	130	77
15 Jul	923	40	236	138
16 Jul	704	32	175	103
17 Jul	3,279	352	512	736
18 Jul	6,566	160	1,868	543
19 Jul	2,911	418	893	836
20 Jul	1,018	1,936	3,773	881
21 Jul	2,589	1,472	2,311	1,406
22 Jul	8,565	3,581	345	1,489
23 Jul	14,264	7,823	1,091	1,998
24 Jul	7,921	8,251	1,950	3,690
25 Jul	6,818	5,082	3,824	3,824
26 Jul	9,931	21,524	5,315	4,822
27 Jul	9,381	33,713	10,942	9,204
28 Jul	3,447	30,104	9,894	15,025
29 Jul	4,680	21,362	12,003	14,742
30 Jul	1,996	12,105	8,124	6,197
31 Jul	3,069	8,787	7,492	4,092
1 Aug	2,758	4,837	3,276	4,315
2 Aug	1,692	8,397	6,854	2,941
3 Aug	1,283	3,054	3,867	3,144
4 Aug	707	3,680	2,278	3,883
5 Aug	933	3,969	6,249	2,745
6 Aug	507	4,656	4,207	4,523
7 Aug	499	2,323	3,650	4,814
8 Aug	385	1,183	2,840	663
9 Aug	146	600	1,329	1,003
10 Au	165	389	807	535
11 Au	184	309	744	541
12 Au	190	313	684	387
13 Au	41	131	441	269
14 Au	47	136	450	267
15 Au	17	107	396	272
GN	99,372	190,907	109,253	100,289
FW	35,363	397,124	16,670	50,663

Note: Fish wheel (FW) apportioned estimates are provided at the bottom of the table. Data will undergo additional statistical analysis when gill net study concludes in 2 or 3 years.

APPENDICES D: CRESCENT RIVER DATA

Appendix D1.—Escapement counts by species for the north bank of the Crescent River, 2012.

Date	Sockeye		Pink		Chum		Chinook		Dolly Varden	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
24 Jun	80	80	0	0	0	0	0	0	0	0
25 Jun	5	85	0	0	0	0	0	0	0	0
26 Jun	143	228	0	0	0	0	0	0	0	0
27 Jun	44	272	0	0	0	0	0	0	0	0
28 Jun	826	1,098	0	0	0	0	0	0	0	0
29 Jun	2,380	3,478	0	0	0	0	0	0	0	0
30 Jun	1,053	4,531	0	0	0	0	0	0	0	0
1 Jul	3,564	8,095	0	0	0	0	0	0	0	0
2 Jul	1,436	9,531	0	0	0	0	0	0	0	0
3 Jul	837	10,368	0	0	0	0	0	0	0	0
4 Jul	275	10,643	0	0	0	0	0	0	0	0
5 Jul	650	11,293	0	0	0	0	0	0	0	0
6 Jul	1,129	12,422	0	0	0	0	0	0	0	0
7 Jul	1,455	13,877	0	0	0	0	0	0	0	0
8 Jul	708	14,585	0	0	0	0	0	0	0	0
9 Jul	386	14,971	0	0	0	0	0	0	0	0
10 Jul	311	15,282	0	0	0	0	0	0	0	0
11 Jul	255	15,537	0	0	0	0	0	0	0	0
12 Jul	259	15,796	0	0	0	0	0	0	0	0
13 Jul	414	16,210	0	0	0	0	0	0	0	0
14 Jul	593	16,803	0	0	0	0	0	0	0	0
15 Jul	503	17,306	0	0	0	0	0	0	0	0
16 Jul	677	17,983	0	0	0	0	0	0	0	0
17 Jul	441	18,424	0	0	0	0	0	0	0	0
18 Jul	296	18,720	29	29	0	0	0	0	30	30
19 Jul	722	19,442	0	29	0	0	0	0	0	30
20 Jul	1,488	20,930	0	29	20	20	5	5	25	55
21 Jul	2,396	23,326	0	29	41	61	0	5	0	55
22 Jul	537	23,863	0	29	30	91	0	5	0	55
23 Jul	1,278	25,140	0	29	37	127	0	5	0	55
24 Jul	1,252	26,392	0	29	54	181	0	5	0	55
25 Jul	396	26,788	0	29	9	190	0	5	0	55
26 Jul	219	27,007	0	29	0	190	0	5	15	70
27 Jul	320	27,327	0	29	14	204	0	5	44	114
28 Jul	365	27,692	0	29	19	224	0	5	115	229
29 Jul	304	27,996	0	29	18	242	0	5	74	303
%	98.0		0.1		0.8		0.0		1.1	
Total	28,574	(48.1% of total sonar count)								

Appendix D2.—Escapement counts by species for the south bank of the Crescent River, 2012.

Date	Sockeye		Pink		Chum		Chinook		Dolly Varden	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
24 Jun	111	111	0	0	0	0	0	0	0	0
25 Jun	184	295	0	0	0	0	0	0	0	0
26 Jun	281	576	0	0	0	0	0	0	0	0
27 Jun	109	685	0	0	0	0	0	0	0	0
28 Jun	816	1,501	0	0	0	0	0	0	0	0
29 Jun	2,329	3,830	0	0	0	0	0	0	0	0
30 Jun	948	4,778	0	0	0	0	0	0	0	0
1 Jul	3,843	8,621	0	0	0	0	0	0	0	0
2 Jul	2,027	10,648	0	0	0	0	0	0	0	0
3 Jul	1,275	11,923	0	0	0	0	0	0	0	0
4 Jul	350	12,273	0	0	0	0	0	0	0	0
5 Jul	633	12,906	0	0	0	0	0	0	0	0
6 Jul	1,874	14,780	0	0	0	0	0	0	0	0
7 Jul	2,677	17,457	0	0	0	0	0	0	0	0
8 Jul	1,643	19,100	0	0	0	0	0	0	0	0
9 Jul	465	19,565	0	0	0	0	0	0	0	0
10 Jul	333	19,898	0	0	0	0	0	0	0	0
11 Jul	394	20,292	0	0	0	0	0	0	0	0
12 Jul	421	20,713	0	0	0	0	0	0	0	0
13 Jul	427	21,140	0	0	0	0	0	0	0	0
14 Jul	1,251	22,391	0	0	0	0	0	0	0	0
15 Jul	570	22,961	0	0	0	0	0	0	0	0
16 Jul	953	23,914	0	0	0	0	0	0	0	0
17 Jul	522	24,436	0	0	0	0	0	0	0	0
18 Jul	347	24,783	35	35	0	0	0	0	35	35
19 Jul	518	25,301	0	35	0	0	0	0	0	35
20 Jul	962	26,263	0	35	13	13	3	3	16	51
21 Jul	1,628	27,891	0	35	28	41	0	3	0	51
22 Jul	435	28,326	0	35	24	65	0	3	0	51
23 Jul	598	28,924	0	35	17	82	0	3	0	51
24 Jul	562	29,485	0	35	24	106	0	3	0	51
25 Jul	421	29,907	0	35	10	116	0	3	0	51
26 Jul	268	30,175	0	35	0	116	0	3	18	69
27 Jul	224	30,399	0	35	10	126	0	3	31	100
28 Jul	209	30,608	0	35	11	137	0	3	66	166
29 Jul	234	30,842	0	35	14	151	0	3	57	223
%	98.7		0.1		0.5		0.0		0.7	
Total	31,254	(43% of total sonar count)								

Appendix D3.—Crescent River north bank escapement counts (total fish) by day and hour, 2012.

Date	Counts by Hour											
	1	2	3	4	5	6	7	8	9	10	11	12
24 Jun	15	2	3	5	3	3	3	2	7	2	22	
25 Jun	0	0	0	1	1	0	0	0	0	0	0	0
26 Jun	0	0	0	0	0	1	0	0	2	0	13	21
27 Jun	2	0	0	0	1	1	0	1	2	1	3	1
28 Jun	20	27	5	14	13	8	17	6	10	4	31	69
29 Jun	48	39	40	23	33	98	16	43	51	109	78	113
30 Jun	36	35	55	6	50	43	8	37	45	27	28	46
1 Jul	11	13	30	121	164	149	67	77	115	199	231	301
2 Jul	5	15	5	7	66	55	19	26	59	65	39	28
3 Jul	43	6	20	19	19	19	131	63	32	47	48	49
4 Jul	2	7	7	12	13	16	2	1	1	1	3	12
5 Jul	9	11	8	4	4	4	5	6	5	12	4	11
6 Jul	47	12	12	4	27	15	12	5	38	37	37	61
7 Jul	46	31	24	20	17	10	27	25	29	50	66	113
8 Jul	120	51	7	21	19	20	17	13	28	40	21	25
9 Jul	40	12	22	3	12	3	7	2	14	9	10	26
10 Jul	38	10	4	6	3	1	13	12	3	0	37	13
11 Jul	22	30	14	6	3	6	3	4	3	9	1	8
12 Jul	2	9	3	6	0	6	11	1	13	16	2	7
13 Jul	9	15	9	7	8	3	13	5	41	4	0	3
14 Jul	3	5	24	4	20	32	45	37	25	23	17	28
15 Jul	5	10	3	13	11	11	27	18	17	22	10	7
16 Jul	3	7	3	11	3	5	5	30	43	39	48	47
17 Jul	17	26	3	27	12	14	18	11	0	0	27	9
18 Jul	2	5	5	7	0	2	6	3	24	8	8	4
19 Jul	5	11	2	6	12	11	8	5	4	18	19	22
20 Jul	8	18	6	2	3	16	9	32	76	102	50	60
21 Jul	57	47	4	6	5	50	99	108	161	209	192	127
22 Jul	9	7	13	0	6	5	19	38	63	40	39	30
23 Jul	12	1	4	3	1	9	29	76	51	32	77	91
24 Jul	29	7	10	17	144	173	182	17	134	46	32	22
25 Jul	54	27	23	26	18	13	6	6	6	7	12	5
26 Jul	22	28	14	19	22	5	13	4	8	5	2	9
27 Jul	8	26	4	6	5	19	24	22	10	1	24	16
28 Jul	10	25	16	22	13	32	21	19	31	21	19	30
29 Jul	5	12	10	18	14	25	33	15	21	8	13	27
Total	764	587	412	472	745	883	915	771	1,167	1,218	1,243	1,463
%	2.7	2.1	1.4	1.7	2.6	3.1	3.2	2.7	4.1	4.3	4.4	5.1
Cum	2.7	4.7	6.2	7.8	10.4	13.5	16.7	19.4	23.5	27.8	32.1	37.2

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Date	Counts by Hour												Daily Total
	13	14	15	16	17	18	19	20	21	22	23	24	
24 Jun	0	1	2	2	1	0	0	1	1	2	0	0	80
25 Jun	0	3	0	0	0	0	0	0	0	0	0	0	5
26 Jun	24	13	17	18	3	7	4	2	4	0	4	10	143
27 Jun	1	1	1	2	4	14	1	3	1	2	0	2	44
28 Jun	37	95	95	63	46	5	99	77	46	19	12	8	826
29 Jun	140	252	288	153	136	135	237	110	87	32	80	39	2,380
30 Jun	15	26	56	42	57	100	86	107	74	42	18	14	1,053
1 Jul	192	118	159	94	229	520	338	187	140	66	31	12	3,564
2 Jul	49	51	44	30	25	95	181	153	133	93	121	72	1,436
3 Jul	21	43	43	20	8	6	45	88	26	26	9	6	837
4 Jul	16	1	25	6	20	18	4	15	58	21	14	0	275
5 Jul	35	20	8	20	20	10	4	11	155	177	66	41	650
6 Jul	23	50	28	22	12	14	5	19	270	253	82	44	1,129
7 Jul	73	61	77	67	44	14	9	11	196	255	141	49	1,455
8 Jul	28	19	41	38	23	25	7	13	7	13	59	53	708
9 Jul	32	10	33	22	8	15	13	18	3	1	25	46	386
10 Jul	13	6	15	9	11	8	3	4	6	6	34	56	311
11 Jul	10	0	11	13	19	19	6	23	34	8	3	0	255
12 Jul	5	8	14	26	27	35	20	17	18	2	7	4	259
13 Jul	1	6	8	48	42	25	33	44	34	16	15	25	414
14 Jul	21	11	20	18	97	46	49	26	12	4	11	15	593
15 Jul	8	23	27	8	11	69	58	52	18	52	19	4	503
16 Jul	23	25	30	17	48	83	82	46	21	23	20	15	677
17 Jul	17	12	5	8	22	16	46	46	25	35	41	4	441
18 Jul	7	13	25	13	16	10	82	40	15	24	15	21	355
19 Jul	18	17	9	18	18	20	130	111	65	110	44	39	722
20 Jul	71	61	83	84	52	45	130	280	114	127	62	47	1,538
21 Jul	87	142	108	130	104	52	180	120	196	149	85	19	2,437
22 Jul	50	34	19	39	13	20	24	5	15	13	47	19	567
23 Jul	183	119	90	47	47	50	29	47	20	117	132	47	1,314
24 Jul	10	39	38	6	5	1	4	3	3	158	169	57	1,306
25 Jul	14	2	0	6	5	2	2	2	0	0	79	90	405
26 Jul	9	9	4	9	10	5	0	10	3	8	7	9	234
27 Jul	20	22	42	39	40	13	6	12	6	2	3	8	378
28 Jul	18	20	21	29	27	21	33	15	17	17	14	8	499
29 Jul	7	11	11	38	16	16	16	16	16	16	16	16	396
Total	1,278	1,344	1,497	1,204	1,266	1,534	1,966	1,734	1,839	1,889	1,485	899	28,574
%	4.5	4.7	5.2	4.2	4.4	5.4	6.9	6.1	6.4	6.6	5.2	3.1	
Cum	41.7	46.4	51.7	55.9	60.3	65.7	72.5	78.6	85.0	91.7	96.9	100.0	

Appendix D4.—Crescent River south bank escapement counts (total fish) by day and hour, 2012.

Date	Counts by Hour											
	1	2	3	4	5	6	7	8	9	10	11	12
24 Jun	10	2	2	1	2	1	4	14	3	12	5	3
25 Jun	4	5	7	10	9	5	7	14	10	8	4	13
26 Jun	9	12	6	5	7	9	5	1	1	14	11	10
27 Jun	9	9	9	20	8	11	7	6	8	8	0	0
28 Jun	6	2	2	1	2	1	4	0	2	5	0	2
29 Jun	6	25	15	13	13	5	16	4	55	96	177	197
30 Jun	0	0	4	29	16	12	3	14	12	30	102	47
1 Jul	4	3	22	89	94	141	86	230	164	261	462	247
2 Jul	8	8	2	16	109	81	83	83	84	138	55	101
3 Jul	67	0	9	15	8	18	63	104	87	53	83	98
4 Jul	4	13	3	1	0	0	10	0	4	9	4	5
5 Jul	4	10	3	3	0	0	0	0	4	4	22	46
6 Jul	45	8	28	21	21	28	53	19	155	173	99	92
7 Jul	27	75	34	11	21	23	62	82	113	220	238	270
8 Jul	29	32	53	72	64	8	13	43	92	171	172	117
9 Jul	28	15	11	0	7	4	3	17	24	20	26	70
10 Jul	29	11	2	1	0	8	10	3	8	15	3	6
11 Jul	20	18	3	4	1	10	13	4	6	4	36	22
12 Jul	2	33	8	0	2	0	4	1	21	30	0	32
13 Jul	13	25	34	0	6	0	19	17	34	6	15	22
14 Jul	1	31	39	7	45	2	19	28	66	13	43	42
15 Jul	19	9	1	0	3	3	7	9	8	36	3	5
16 Jul	1	22	4	2	0	0	0	0	1	0	23	41
17 Jul	16	11	7	2	3	11	10	1	5	19	36	31
18 Jul	10	15	5	13	6	5	1	0	2	8	0	5
19 Jul	3	4	1	0	0	0	9	1	16	7	13	9
20 Jul	5	1	0	4	1	2	3	45	45	44	27	41
21 Jul	13	10	47	10	9	20	27	39	275	227	156	85
22 Jul	19	8	0	4	0	3	9	8	18	30	67	64
23 Jul	0	2	1	1	0	0	0	0	1	0	1	0
24 Jul	31	40	33	2	13	17	8	6	24	60	15	28
25 Jul	9	17	13	11	22	39	27	10	12	35	43	14
26 Jul	10	28	15	3	0	15	22	0	6	9	19	31
27 Jul	29	5	0	0	9	18	23	11	11	20	21	10
28 Jul	3	0	16	9	5	27	24	12	21	15	9	26
29 Jul	0	9	16	1	16	18	23	20	14	15	8	1
Total	493	518	455	381	522	545	677	846	1,412	1,815	1,998	1,833
%	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Cum	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.6	0.7	0.9

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Date	Counts by Hour												Daily Total
	13	14	15	16	17	18	19	20	21	22	23	24	
24 Jun	1	6	4	4	6	2	7	4	2	10	0	6	111
25 Jun	6	7	12	5	6	5	9	7	6	6	8	11	184
26 Jun	2	13	17	13	22	24	10	25	28	12	12	13	281
27 Jun	0	9	0	1	0	1	0	0	0	0	1	2	109
28 Jun	0	9	7	11	6	223	402	69	50	7	5	0	816
29 Jun	255	272	303	226	173	143	154	102	61	10	4	4	2,329
30 Jun	48	47	91	46	44	82	127	93	66	14	12	9	948
1 Jul	283	266	214	107	223	421	273	113	66	50	24	0	3,843
2 Jul	119	48	80	34	96	101	220	164	104	104	122	67	2,027
3 Jul	105	59	84	33	10	14	111	109	101	26	16	2	1,275
4 Jul	6	6	29	11	38	35	26	31	50	37	20	8	350
5 Jul	35	24	19	40	8	37	9	38	97	104	76	50	633
6 Jul	48	55	55	32	20	22	14	10	395	274	125	82	1,874
7 Jul	167	68	67	103	60	112	23	5	159	500	205	32	2,677
8 Jul	82	61	120	110	109	59	29	34	36	30	66	41	1,643
9 Jul	44	30	26	16	23	15	26	6	18	3	6	27	465
10 Jul	28	30	32	27	4	11	4	14	2	3	47	35	333
11 Jul	10	27	22	21	40	27	23	35	41	7	0	0	394
12 Jul	6	5	12	20	32	45	39	29	25	25	18	32	421
13 Jul	4	39	12	19	34	31	35	16	22	12	5	7	427
14 Jul	81	133	174	76	65	94	52	106	62	64	5	3	1,251
15 Jul	0	13	27	95	32	75	82	78	39	13	12	1	570
16 Jul	26	54	78	40	33	66	287	136	101	11	13	14	953
17 Jul	12	0	6	20	56	56	71	46	61	8	23	11	522
18 Jul	7	6	9	1	19	4	38	54	74	97	21	17	417
19 Jul	27	6	8	10	16	17	138	114	60	32	19	8	518
20 Jul	53	34	24	54	96	42	64	171	92	75	51	20	994
21 Jul	98	68	49	58	28	29	34	82	106	107	61	18	1,656
22 Jul	46	31	62	44	40	0	3	0	2	0	1	0	459
23 Jul	0	0	23	1	8	0	27	68	38	236	144	64	615
24 Jul	27	19	40	26	11	14	12	5	6	19	70	60	586
25 Jul	36	15	10	12	6	5	17	3	1	22	43	9	431
26 Jul	16	16	22	15	7	13	4	4	3	2	6	20	286
27 Jul	8	18	9	12	7	2	5	11	8	8	5	15	265
28 Jul	8	23	10	17	10	10	9	10	5	3	5	9	286
29 Jul	9	9	26	16	13	13	13	13	13	13	13	13	305
Total	1,703	1,526	1,783	1,376	1,401	1,850	2,397	1,805	2,000	1,944	1,264	710	31,254
%	5.4	4.9	5.7	4.4	4.5	5.9	7.7	5.8	6.4	6.2	4.0	2.3	
Cum	42.2	47.1	52.8	57.2	61.7	67.6	75.3	81.1	87.5	93.7	97.7	100.0	

Appendix D5.—Crescent River north bank Bendix sonar counts (total fish) by day and sector, 2012.

Date	Counts by Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
24 Jun	21	31	6	4	7	8	3	0	0	0	0	0	80
25 Jun	5	0	0	0	0	0	0	0	0	0	0	0	5
26 Jun	6	37	5	1	13	14	36	12	12	3	2	2	143
27 Jun	5	2	1	0	4	2	3	1	3	17	3	3	44
28 Jun	36	7	67	110	101	135	131	126	38	58	9	8	826
29 Jun	207	83	609	742	415	220	58	29	12	4	0	1	2,380
30 Jun	196	96	278	260	111	49	29	26	5	2	1	0	1,053
1 Jul	132	374	1,304	1,178	358	133	47	30	5	3	0	0	3,564
2 Jul	7	148	417	510	192	98	22	29	10	2	0	1	1,436
3 Jul	18	42	45	222	232	172	43	43	18	0	2	0	837
4 Jul	0	9	14	6	37	78	56	52	18	3	1	1	275
5 Jul	15	162	178	157	64	39	18	7	8	1	1	0	650
6 Jul	8	40	102	378	313	200	40	28	17	3	0	0	1,129
7 Jul	3	51	47	177	386	502	126	123	33	7	0	0	1,455
8 Jul	47	72	64	43	107	184	67	83	32	9	0	0	708
9 Jul	0	9	26	90	57	50	69	64	12	7	2	0	386
10 Jul	6	1	19	97	45	44	33	25	18	19	2	2	311
11 Jul	1	0	26	91	40	45	21	16	7	7	1	0	255
12 Jul	19	50	35	69	12	70	4	0	0	0	0	0	259
13 Jul	4	15	18	100	17	112	90	33	12	12	1	0	414
14 Jul	5	9	16	78	187	81	30	18	130	39	0	0	593
15 Jul	1	19	46	132	216	65	24	0	0	0	0	0	503
16 Jul	0	6	25	79	192	236	102	33	3	0	0	1	677
17 Jul	1	14	37	31	137	98	73	40	1	3	0	6	441
18 Jul	2	12	45	102	123	43	16	11	0	0	1	0	355
19 Jul	11	151	242	184	70	36	17	3	0	0	8	0	722
20 Jul	306	636	338	101	54	43	38	17	2	2	1	0	1,538
21 Jul	734	768	328	419	87	34	37	19	4	2	2	3	2,437
22 Jul	83	149	100	126	45	28	12	7	1	0	0	16	567
23 Jul	37	131	295	389	239	155	34	14	15	2	3	0	1,314
24 Jul	7	104	520	230	227	145	29	23	16	4	1	0	1,306
25 Jul	4	53	186	59	79	19	5	0	0	0	0	0	405
26 Jul	5	44	84	33	48	19	1	0	0	0	0	0	234
27 Jul	7	77	68	103	58	43	4	14	4	0	0	0	378
28 Jul	23	135	96	137	61	37	6	2	1	0	1	0	499
29 Jul	26	92	100	69	55	31	11	7	4	0	1	0	396
Total	1,988	3,629	5,787	6,507	4,389	3,268	1,335	935	441	209	43	44	28,575
%	7.0	12.7	20.3	22.8	15.4	11.4	4.7	3.3	1.5	0.7	0.2	0.2	
Cum	7.0	19.7	39.9	62.7	78.0	89.5	94.1	97.4	99.0	99.7	99.8	100.0	

Appendix D6.—Crescent River south bank Bendix sonar counts (total fish) by day and sector, 2012.

Date	Counts by Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
24 Jun	25	11	6	1	0	2	12	34	11	8	1	0	111
25 Jun	2	0	0	0	13	39	55	56	11	8	0	0	184
26 Jun	33	13	26	52	53	56	27	16	5	0	0	0	281
27 Jun	23	21	11	41	9	0	0	2	0	0	1	1	109
28 Jun	6	86	230	183	136	83	31	26	17	6	4	8	816
29 Jun	20	220	697	598	406	210	98	53	22	3	1	1	2,329
30 Jun	15	127	278	170	178	108	36	24	11	0	0	1	948
1 Jul	76	572	1,189	799	532	357	169	113	29	4	0	3	3,843
2 Jul	34	279	629	397	271	215	106	66	21	7	1	1	2,027
3 Jul	26	107	298	265	199	193	120	36	20	5	4	2	1,275
4 Jul	0	3	11	45	105	97	47	24	13	4	0	1	350
5 Jul	14	116	177	132	97	46	28	21	1	0	0	1	633
6 Jul	17	176	656	507	305	129	51	17	5	1	9	1	1,874
7 Jul	16	111	680	842	599	295	78	33	5	1	12	5	2,677
8 Jul	56	93	321	451	398	213	62	25	7	1	7	9	1,643
9 Jul	3	7	17	57	139	146	60	20	8	2	0	6	465
10 Jul	0	14	40	66	85	58	36	19	6	3	0	6	333
11 Jul	1	28	60	100	120	58	15	7	3	2	0	0	394
12 Jul	22	106	129	89	45	13	10	6	0	0	1	0	421
13 Jul	0	20	53	101	139	38	56	15	2	2	0	1	427
14 Jul	28	35	117	297	363	221	139	46	3	2	0	0	1,251
15 Jul	0	28	149	168	161	54	7	3	0	0	0	0	570
16 Jul	0	38	155	342	258	107	42	9	1	1	0	0	953
17 Jul	4	21	115	163	151	52	11	4	1	0	0	0	522
18 Jul	29	98	105	101	61	15	5	2	1	0	0	0	417
19 Jul	24	144	190	107	38	8	5	2	0	0	0	0	518
20 Jul	217	329	292	94	42	11	7	1	1	0	0	0	994
21 Jul	438	412	402	200	114	56	30	3	1	0	0	0	1,656
22 Jul	50	131	125	71	39	20	12	6	4	1	0	0	459
23 Jul	79	215	190	82	23	10	8	3	2	1	0	2	615
24 Jul	44	152	241	113	17	10	7	0	0	1	0	1	586
25 Jul	12	58	160	130	32	16	11	5	0	0	1	6	431
26 Jul	17	52	114	67	10	10	13	1	0	1	1	0	286
27 Jul	20	64	112	41	8	9	8	2	1	0	0	0	265
28 Jul	20	69	117	44	10	15	8	2	1	0	0	0	286
29 Jul	40	88	81	47	18	21	4	3	2	1	0	0	305
Total	1,411	4,044	8,173	6,963	5,174	2,991	1,414	705	215	65	43	56	31,254
%	4.5	12.9	26.2	22.3	16.6	9.6	4.5	2.3	0.7	0.2	0.1	0.2	
Cum	4.5	17.5	43.6	65.9	82.4	92.0	96.5	98.8	99.5	99.7	99.8	100.0	